



*The 66th IEEE
Vehicular Technology Conference*

Final Program



30 September - 3 October 2007

Renaissance Harborplace Hotel

Baltimore, MD

Welcome from the General Chair

The IEEE Vehicular Technology Society and the members of the IEEE Baltimore community would like to thank you for participating in our fall international conference in Baltimore, Maryland, U.S.A. This is the 66th Vehicular Technology Conference.



The theme of the conference is “Portal to the Future of Mobile Technology”. In addition to having a carefully selected, strong technical program, the conference features visionary plenaries from high profile speakers, and exciting tutorials that represent technical innovation and applications associated with an ever-expanding wireless industry.

Also, the new WiVeC conference is co-located this year with VTC and will offer attendees the opportunity to learn and discuss the latest technology trends in vehicular-to-vehicular communications.

The VTC2007-Fall Conference provides a venue for wireless telecommunications including digital signal processing, transmission technologies and vehicular technologies with academic and industry experts attending to exchange ideas and to discuss their latest projects. The focus is on wireless technologies for 4th generation networks and the hardware, firmware, and software that are making it all a reality.

Baltimore is a wonderful port city and is ideally located for business and pleasure. We have a full agenda to keep you involved and give you the opportunity to network and exchange ideas.

Thank you for your attendance and please enjoy the conference.

Bob Shapiro, *General Chairman*
VTC2007-Fall

Welcome from the TPC Co-Chairs

It is our pleasure to welcome you to the 66th IEEE Vehicular Technology Conference Fall 2007 in Baltimore, Maryland. A total of 732 papers were submitted in total across the tracks: land mobile radio, mobile networks, multiple antennas and space-time processing, propagation and modeling, transmission technologies, transportation systems, vehicular electronics, wireless access, wireless applications, and wireless device architectures. The Track Chairs, with the help of more than 250 Technical Program Committee members and almost 1,500 Reviewers, have assembled an outstanding technical program consisting of 420 papers from the 732 papers submitted.

We would like to thank the Track Chairs, TPC members, reviewers, and organizing committee, largely a volunteer effort, for making this program possible. Of course, we also thank the authors for their high quality submissions.

We hope you enjoy this time to learn from each other and to enjoy being with others that share a common interest. We hope you will find time to attend one of several panel sessions, intended to provoke thought on topics of practical relevance to the Vehicular Technology Society, and one of

several technical tutorials offered prior to the start of the conference. We also hope you will take advantage of the 1st IEEE International Symposium on Wireless Vehicular Communications focusing on vehicle-to-vehicle, vehicle-to-infrastructure, and vehicle-to-person communication being held in conjunction with the VTC conference.

In summary, we wish you a pleasant stay in Baltimore and hope you enjoy the conference.



Greg Bottomley & Robert Heath,
TPC Co-Chairs, VTC2005-Spring

Welcome from the VTS President

On behalf of the IEEE Vehicular Technology Society, it is my great pleasure to welcome you to the IEEE 66th Vehicular Technology Conference in Baltimore, Maryland, USA. I was born in Baltimore, about the same time that the VT Society was born in Detroit. Baltimore is a beautiful location for what I'm sure will be one of the most memorable conferences in recent years. The IEEE Vehicular Technology Society, or VTS for short, unlike most other IEEE Societies, is built around a central theme, rather than a single technology. Our unifying theme is mobility, and our fields of interest are the technologies that support it. We are committed to all aspects of mobility, including telematics, automotive electronics, intelligent transportation systems, and wireless comms.

The organization of a large technical conference like VTC is a major endeavor that involves many

people, mainly volunteers who are members of the Vehicular Technology Society. The continuing success of our conferences depends heavily on the quality work of these committed members of VTS. I thank them all for their generous commitment. A special thank you is in order to the General Chair of the IEEE 66th Vehicular Technology Conference, Bob Shapiro; to the Technical Program co-Chairs, Greg Bottomley and Robert Heath; and to all the other members of the Organizing Committee for the skilled and thoughtful implementation of an excellent program. Finally I wish to thank all the delegates attending the conference, and urge you to take best advantage of both the conference, and the beautiful city of Baltimore.

Charles Backof, *President*
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| Kapil Dandekar | Ilario Filippini | Lajos Hanzo | Jakub Jakubiak | Jean-Marc Kelif | Navid Lashkarian |
| Robert Daniels | Abdulla Firag | Yonggang Hao | Kouji Ishii | Timothy Kennedy | David Laursen |
| Ramez M. Daoud | Robert Fischer | Eric Hardouin | Touha Isik | Panisa Keowsawat | Byong-Ok Lee |
| Timothy Davidson | Mazen Hasna | Fredrik Harrysson | Cyril Iskander | Noor Khan | Dong U Lee |
| Yvo de Jong | A. Ziad Hatahet | Mazen Hasna | Leila Ismail | Amir Khandani | Dongwoo Lee |
| Raul de Lacerda | Hiroyuki Hatano | Paul Fitzpatrick | Predrag Ivanis | Shawqi Kharbash | Heechoon Lee |
| Rodrigo de Lamare | Aawatif Menouni Hayar | Mark Flanagan | Ayako Iwata | Ali Khayrallah | Hoonchul Lee |
| Thomas Deckert | Bei He </td <td>Santiago Flores</td> <td>Józef J. Pawelec</td> <td>Ahmed Kholiaif</td> <td>Heunghwan Lee</td> | Santiago Flores | Józef J. Pawelec | Ahmed Kholiaif | Heunghwan Lee |
| David Declercq | Bing He | Andrea G. Forte | Stefan Jaeckel | Ahmad Khoshnevis | Hyewon Lee |
| Laurent Decreusefond | Jin He | Marc Fossorier | Vivek Jain | Byoung-Hoon Kim | Jaehong Lee |
| Aitor del Coso | Ahmadreza Hedayat | Michele Franceschini | Jakub Jakubiak | Dong Hoi Kim | Jonghoon Lee |
| Hakan Delic | Abdorreza Heidari | Laurent Franck | Joakim Jalden | Dongku Kim | Kang Yong Lee |
| Lin Dengsheng | Jochen Heinzmann | Frank Frederiksen | Niklas Jalden | Hojin Kim | Kyounghwan Lee |
| Mieso Denko | Marc Heissenbüttel | Klemens Freudenthaler | Tommi Jämsä | Hyung Seok Kim | Ye Hoon Lee |
| Anders Derneryd | Ke Wang Helmersson | Victor Frost | Marcel Jar | Hyungjin Kim | Haipeng LEI |
| Charles Despins | Lassi Hentilä | Chunyan Fu | Usman Javaid | Il Han Kim | Ming Lei |
| Carole Devlin | Tero Henttonen | Hongyi Fu | Imad Jawhar | Jaekwon Kim | Zhongding Lei |
| Riadh Dhaou | Ángela Hernández-Solana | Shaojian Fu | A.D.S. Jayalath | Jaeweon Kim | Regis Lerbour |
| Rocco Di Taranto | Sebastian Hessel | Thomas Fügen | Dhammika Jayalath | Jongkyung Kim | Thierry Lestable |
| Guillermo Diaz Delgado | Siew-Lee Hew | Hiroshi Furukawa | Esrafil Jedari | Jongwon Kim | Alexe Leu |
| Chris Dick | Guido Hiertz | Haris Gacanin | Li-Der Jeng | Michael Jensen | Geert Leus |
| Matthias Dick | William Hillery | Yasser Gadallah | Ulf Jennehag | Kyeong Jin Kim | Marco Levorato |
| John Dielissen | Heidi Himmanen | Slawomir Gajewski | Michael Jensen | Kyung Soo Kim | Cheng Li |
| Nikos Dimitriou | Roberto Carlos Hincapie Reyes | Hiren Gami | Baowei Ji | Nak-Myeong Kim | Chih-Peng Li |
| Emil Dimitrov | Richard Hodges | Liu Gan | Tingfang Ji | Pansoo Kim | Dong Li |
| Peilu Ding | Rainer Hoekmann | Xiaoying Gan | Huileng Jia | Sang Wu Kim | Frank Haizhon Li |
| Zhihong Ding | Ian Holland | Harish Ganapathy | Chungeng Jia | Woojae Kim | Guansheng Li |
| Rui Dinis | | Long Gao | Hai Jiang | Yeejung Kim | Guoqing Li |
| Anna K Dinnis | | Xinying Gao | Jinjing Jiang | Yong-Seok Kim | Hongxiang Li |
| Michael Doering | | Xiqi Gao | Lei Jiang | | Jikai Li |
| | | | Ming Jiang | | |

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|------------------------|------------------------|------------------------|-----------------------|------------------------|----------------------|
| Jing Li | Bharat Madan | Liam Murphy | Nikos Passas | Gerd Richter | Chien-Chung Shen |
| Jingli Li | Koji Maeda | Ken Murray | R.F. Pawula | Jim Ritcey | Chong Shen |
| Kai Li | Andreas Maeder | Chandra Murthy | Miquel Payaro | Mona E. Rizvi | Gang Shen |
| Kinfai Li | Maurizio Magarini | Siva Muruganathan | Dave Pearce | Jim Roberts | Min Shen |
| Li Li | David Magee | Osamu Muta | Klaus Pedersen | Daniel Rodellar | Yuan Shen |
| Mingke Li | Saeed Ghazi Maghrebi | Rohit Nabar | Troels Pedersen | António Rodrigues | Weihua Sheng |
| Pan Li | Behrad Mahboobi | Toshihisa Nabetani | Christian B. Peel | Hu Rong | Hou Shengwei |
| Qiang Li | Toktam Mahmoodi | Hamid Nafaa | Jiang Peigang | Sun Rong | David Shepherd |
| Qun Li | Ashraf S. Hasan | Liu Naijin | Mauro Pelosi | Thanasis Rontogiannis | Jun Shi |
| Ruidong Li | Mahmoud | Junyoung Nam | Alexander Pelov | Stefano Rosati | Minghui Shi |
| Tianji Li | Hisham A. Mahmoud | Milan Narandžić | Fei Peng | Francesco Rossetto | Qingyan Shi |
| Wei Li | Laurence Mailaender | Adarsh | Jun Peng | Stephanie Rouquette- | Tao Shi |
| Xiangming Li | Juha-Pekka Mäkelä | Narasimhamurthy | Yanlin Peng | Leveil | Zhenning Shi |
| Xiaohua Li | Konstantinos Maliatsos | Ahmed Nasif | Eldad Perahia | Arnab Roy | Changyue Shin |
| Yabo Li | Wasim Malik | Jad Nasreddine | Ana Perez | Sébastien Roy | Dong Ryeol Shin |
| Yu Li | Ranjan Mallik | Nidal Nasser | Maria Perez-Guirao | Donghua Ruan | Tao Shu |
| Zexian Li | Abdelhamid Mammeri | Balasubramaniam | Bojan Peric | Matt Ruan | Khaled Shuaib |
| Zi Li | Gaurav Pradeep | Natarajan | Ivan Perisa | Alexey Rubtsov | Deng Shuangcheng |
| Weifa Liang | Mandhare | Maciej Nawrocki | Michael Peter | Pedro Ruiz | John Shynk |
| Yang-wen Liang | Stefan Mangold | Fawad Nazir | Evtim Peytchev | Ashutosh Sabharwal | Mihail Sichitiu |
| Ying-Chang Liang | Athanassios Manikas | Jill Nelson | Kaustubh Phanse | Hamid Sadjadpour | Shreeram Sigdel |
| Zhenyu Liang | Kyriakos Manousakis | Cho Yiu Ng | Bui Huu Phu | Nima Safari | Moh Lim Sim |
| Ching-Yu Liao | Ashok Mantravadi | Edith Ngai | Zhouyue Pi | Onur Sahin | Robert Simon |
| Guan-Hsiung Liaw | Shiwen Mao | Telex Ngatched | Salvatore Pileggi | Mohamed Sahnoudi | Arne Simonsson |
| Lavy Libman | Xingpeng Mao | Ha Nguyen | Wang Ping | Kentaro Saito | Mohammed T Simsim |
| Lorne Liechty | Nicola Marchetti | Huan Cong Nguyen | Simon Plass | Khaled Salah | Shubhranshu Singh |
| Boon Chin Lim | V Mariappan | Trung Nguyen | Ajay Kumar Poddar | Haythem Bany Salameh | Iana Siomina |
| Teng Joon Lim | Brian Mark | Xuan Huan Nguyen | Jussi Poikonen | Miguel Salas Natera | Harsha Sirisena |
| Bin Lin | Vuk Marojevic | Qiang Ni | Akhilesh Pokhariyal | Yassine Salih Alj | Matthew Skalny |
| Darryl Dexu Lin | Roman Marsalek | C Nie | Adam Pollard | Farag Sallabi | Ben Slimane |
| Jia-Chin Lin | Philippe Martins | Jing Nie | Dmitry Ponomarev | Sana Salous | Ben Slimane |
| Tsui-Tsai Lin | David Martin-Sacristan | Jarno Niemela | Dimitrie C. Popescu | Venkatesh Sampath | Mohammed Smadi |
| Tzu-Ming Lin | Philippe Mary | Rajagopal Nilavalan | Francesco Potorti | Yukitoshi Sanada | Besma Smida |
| Yuxia Lin | Ignacio Más | Hiroshi Nishimoto | Vahid Pourahmadi | Juan Jesús Sánchez- | David Smith |
| Zinan Lin | Barbara Masini | Dusit Niyato | Basuki Priyanto | Sánchez | Chris Snow |
| Janne Lindqvist | Daniel Massicotte | Keith Nolan | Chutima Prommak | Stephan Sand | Aaron So |
| Xinhua Ling | David W. Matolak | Andre Noll Barreto | Ioannis Psaromiligkos | Amichi Sanderovich | Hing-Cheung So |
| Jonathan Ling | David Mazzaresse | Dan Noneaker | Man-On Pun | Luca Sanguinetti | Saied Soliman |
| Bo-Chieh Liu | Jimmy McGibney | Sven Nordholm | Ali Pusane | Susana Sargento | Vahid Solouk |
| Chia-Hornng Liu | Tom McGiffen | Aria Nosratinia | Ramesh Pyndiah | Jahangir H. Sarker | Chengqi Song |
| Chun-Hung Liu | Mehri Mehrjoo | Robert Novak | Mahmoud Qasaymeh | Ioannis Sarris | Joo-Han Song |
| Fang Liu | Qurban Memon | Josiane Nzouonta | Zhang Qi | Philippe Sartori | Min Song |
| Hong Liu | Geoffrey Messier | Hideki Ochiai | Yi Qian | Gary Saulnier | Wei Song |
| Hsin-Chin Liu | David Michelson | Claude Oestges | Zhu Qiang | Amir Sayegh | Jerome Sonnenberg |
| Jun Liu | Pietro Michiardi | Tim O'Farrell | Yang Qin | Kamran Sayrafian | Anthony Soong |
| Ke Liu | Bartosz Mielczarek | Koichi Ogawa | Dai Ming Qu | Marcus Schämamm | Michael Souryal |
| Ping Liu | Jan Mietzner | Masakatsu Ogawa | Sadia Quadri | Malte Schellmann | Alkan soysal |
| Tsung-Hsien Liu | Yoshichika Ohta | Yoshichika Ohta | Tony Q.S. Quek | Tim Schenk | Ethem Sozer |
| Qijia Liu | Robert Olesen | Robert Olesen | Britton Quist | Morten Schlaeger | Sebastian Speicher |
| Rui Liu | Wail Omar | Wail Omar | Alberto Rabacchin | Christian Schlegel | Joachim Speidel |
| Stanley Liu | Olga Ormond | Olga Ormond | Tamer Rabie | Javier Schloemann | Andreas Springer |
| Tao Liu | H. Minn | Afif Osseiran | Hamed Mohsenian Rad | Sascha Schnauffer | Ioannis Spyropoulos |
| Wei Liu | Jelena Misis | Yuan Ouyang | Giuseppe Raffa | Hendrik Schoeneich | Mohammed Sqalli |
| Wei-Cheng Liu | Jeebak Mitra | Yuehui Ouyang | Vasanthan Raghavan | Bernd Schröder | Seshan Srirangarajan |
| Wen-Jiunn Liu | Wei Mo | Yasunori Owada | Mohammed Ziaur | Ulrich Schuster | Vivek Srivastava |
| William Liu | Nader Moayeri | Ozgur Oyman | Rahman | Gonzalo Seco-Granados | Dirk Staehle |
| Xiangqian Liu | Amin Moabasher | Berna Ozbek | Valavan Rajakumar | Karim Seddik | Kostas Stamatiou |
| Yao-Yuan Liu | Mohammad | Sangheon Pack | Rakesh Rajbanshi | Akram Bin Sediq | Daniel Stancil |
| Youjian Liu | Mohammadnia-Avval | Dimitris A. Pados | Harish Ramchandran | Pongsatorn Sedtheetorn | David Steer |
| Yu-Sun Liu | Bishwarup Mondal | Daniel Palomar | R. Ramesh | Selvakenedy | Boris Stender |
| Zhengye Liu | Shahab Moradi | Cristiano Panazio | Vittorio Rampa | Selvadurai | Antoine Stephan |
| Zhiqiang Liu | Raquel Morera | Tarkesh Pande | Anil Rao | Indranil Sen | Haroon Stephen |
| Caleb Lo | Yasser Morgan | Ashish Pandharipande | Raghu Rao | Kibeom Seong | Alex Stephenne |
| Afzal Lodhi | Ali Morshedi | Shyam Pandula | Raveendra Rao | Semih Serbetli | Enrique Stevens- |
| Andrew Logothetis | Carlos Mosquera | Ai-Chun Pang | Terhi Rautiainen | Erchin Serpedin | Navarro |
| Roberto López-Valcarce | Mohammad Amir | Qixiang Pang | Niranjay Ravindran | Rohit Iyer Seshadri | Marc St-Hilaire |
| Mahdi Lotfinezhad | Moulavi | George Pantos | Charles Razzell | Stefania Sesia | HJ Su |
| Wenjing Lou | Hessam Moussavinik | Stelios Papaharalabos | Susan Rea | Aydin Sezgin | Hang Su |
| David Lovell | Mohamed | Nikos Papanikolopoulos | Mark C. Reed | Reza Shahidi | Zhong Su |
| Angel Lozano | MoustafaAbd-El Aziz | Apostolos | Mohamed Tamer Refaei | Vahid Shah-Mansouri | Anand Prabhu |
| Ji Luo | Moustafa | Papathanassiou | Luca Reggiani | Nahid Shahmehri | Subramanian |
| Tao LUO | Aris Moustakas | Ambuj Parihar | Frank Reichenbach | Surendran Konavattam | Riky Subrata |
| Wei Luo | Marc Mowler | Changsoon Park | Fang-Ching Ren | Shanmugam | Hirohito Suda |
| Xuanwen Luo | Abdurazak Mudesir | CheolHee Park | Guangliang Ren | Lei Shao | Norrozila Sulaiman |
| Zongyang Luo | Gero Muehl | Daeyoung Park | Jun Ren | Shihai Shao | Bo Sun |
| Hung Ly | Andreas Mueller | Hyuncheol Park | Pingyi Ren | Masoud Sharif | Chen Sun |
| Nader M. | Amitav Mukherjee | Ji-Hyun Park | Eric Renault | Naresh Sharma | Jian Sun |
| Qian Ma | Kiran Mukkavilli | Jung-Hyun Park | Jaume Riba | Duncan Sharp | Fanglei Sun |
| Jun Ma | Sandeep Mukthavaram | Minyoung Park | Mathias Riback | John Shea | Sumei Sun |
| Xiaoli Ma | Thomas Mundt | Seung Young Park | Mark Rice | Hemabh Shekhar | Yakun Sun |
| Yao Ma | Saad Munir | Vince Park | Michael Rice | Tarek Sheltami | Yang Sun |
| Giuseppe Macchiarella | Gabriel-Miro Muntean | Antonio Pascual-Iserte | Paul Richardson | Charles Q. Shen | Yi Sun |

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|---------------------|------------------------|---------------------|---------------------|-----------------------|-------------------|
| Yong Sun | Chih-Cheng Tseng | Chenwei Wang | Seok Won | Serhan Yarkan | Jun Zhang |
| Zhi Sun | Po-Hsuan Tseng | Chin-Liang Wang | Seung-Hwan Won | Ali Yazdan-Panah | Kai Zhang |
| CW Sung | Shu-Ming Tseng | Dan Wang | David Tung Chong | Lei Ye | Lu Zhang |
| Chang Kyung Sung | Yu-Chee Tseng | Feng Wang | Wong | Zhenzhen Ye | Nan Zhang |
| Dan Keun Sung | Theodoros Tsiftsis | Haibo Wang | Vincent W.S. Wong | Ping-Cheng Yeh | Angela Zhang |
| Youngchul Sung | Fredrik Tufvesson | Haitang Wang | W K Wong | Aylin Yener | Q.T. Zhang |
| Himal Suraweera | Damla Turgut | Honggang Wang | Dalei Wu | Hun-je Yeon | Qi Zhang |
| Pasi Suvikunnas | Alexander Tyrrell | Hongzheng Wang | Dapeng Oliver Wu | Chun Kin Au Yeung | Qian Zhang |
| Hajime Suzuki | Hironori Uchikawa | Jiangzhou Wang | Jim Wu | Hua-Chiang Yin | Rongrong Zhang |
| Thomas Svantesson | Fang-Biau Ueng | Jianqi Wang | J. Y. Wu | Xuefeng Yin | Rui Zhang |
| Daniel Svensson | Elisabeth Uhlemann | Jintao Wang | Hongyi Wu | Li Jian Ying | Shengli Zhang |
| Ananthram Swami | Satish Ukkusuri | Jun Wang | Jing Wu | Simon Yiu | Wei Zhang |
| Jan Sykora | Matthias Unbehaun | Jun Wang | Tong Wu | Kenya Yonezawa | Wenshu Zhang |
| Abd-Elhamid Taha | Peter Unger | Li-Chun Wang | Yik-Chung Wu | Su Khiong Yong | Xi Zhang |
| Ying Y. Tai | Shintaro Uno | Ping Wang | Zhiqiang Wu | Taesang Yoo | Xiaodi Zhang |
| Satoshi Takahashi | Okta Yureten | Ruhai Wang | Zhiyuan Wu | Young Geon Yoo | Yan Zhang |
| Friedman Tchoffo | Guillaume Urvoy-Keller | Shuangquan Wang | Alexander Wyglinski | Chanho Yoon | Yanchao Zhang |
| Talom | Yoriko Utsunomiya | Tsang-Yi Wang | Spyros Xergias | Akiyo Yoshimoto | Yingjun Zhang |
| Hailun Tan | Sam Wakil | Wei Wang | Fang Xi | Huiqing You | Yu Zhang |
| Hwee Pink Tan | Esteban Valles | Wenye Wang | He Xiaoben | Taewan You | Zhan Zhang |
| Jindong Tan | Eddy van den Broek | Xianbin Wang | Tao Xiaofeng | Mohamed Youssef | Zhongshan Zhang |
| Hiroya Tanaka | Alessandro Vanelli- | Xin Wang | Kai Xie | Donghun Yu | Ziyi Zhang |
| Mario Tanda | Coralli | Xudong Wang | Chungsheng Xin | Fei Richard Yu | Bin Zhao |
| Lan Tang | Timo Vanhatupa | You-Chiun Wang | Yan Xin | Jung-Lang Yu | Dongmei Zhao |
| Shensheng Tang | Badri Varadarajan | Yu Wang | Jian Xiong | Kai Yu | Lian Zhao |
| Weerakhan | Kanchan Vardhe | Yue Wang | Daniel Xu | Meng Yu | Ming Zhao |
| Tantiphaiboontana | Vasos Vassiliou | Zhengdao Wang | Dongxia Xu | Qiang Yu | Qing Zhao |
| He Tao | Gayathri Venkataraman | Zhuwei Wang | Fangmin Xu | S. -Z. Yu | Tong Zhao |
| Pablo Tapia | Christos Verikoukis | Chin-Der Wann | Huilin Xu | Shui Yu | Weijiang Zhao |
| Piya Techateerawat | Mahdi Masoumi Verki | Deric Waters | Jinghao Xu | Xiang Yu | Xiongwen Zhao |
| Chintha Tellambura | Javier Via | K. C. B. Wavegedara | Jun Xu | Yifan Yu | Yi Zhao |
| Adam Tenenbaum | Fausto Vieira | Matthew Webb | Sen Xu | Tevfik Yücek | Chen Zheng |
| Manos Tentzeris | Robson. Vieira | Stefan Weber | Yi Xu | Xiaodong Yue | Feng Zheng |
| Ryan Thomas | Rajiv Vijayakumar | Steven Weber | Zhengyi Xu | Chau Yuen | Xiayu Zheng |
| Timothy Thomas | Saravanan | Tobias Weber | Wang Yafeng | Mira Yun | Hao Zhong |
| Tao Tian | Vijayakumaran | Anne Wei | Koji Yamamoto | Zainab Zaidi | Quan Zhou |
| Xiaohua Tian | Marco Villanti | Hung-Yu Wei | Hongbo Yan | Zaki Iskandar Zakaria | Shengli Zhou |
| Andreas Timm-Giel | Pedro Eduardo | Shuangqing Wei | Yong Yan | Randa Zakhour | Xin Zhou |
| Bogdan Timus | Villanueva-Pena | Xusheng Wei | Eunho Yang | M. Zamani | Yiqing Zhou |
| See Ho Ting | John Villasenor | Zhu Wei | Hong-Chuan Yang | Paolo Zanier | Zhigang Zhou |
| Olav Tirkkonen | Tiago Vinhoza | Petra Weitkemper | Hyun Jong Yang | Thomas Zemen | Zhong Zhou |
| Alessandro Tomasoni | Sriram Vishwanath | Oliver Wellnitz | Jen-Shun Yang | Qingan Zeng | X. Zhu |
| Murat Torlak | Jens Voigt | Hao Wen | Jie Yang | Xiang Nian Zeng | Jing Zhu |
| Paulo Torres | John Volakis | Mattias Wennström | Kai Yang | Hans-Jürgen Zepernick | Lei Zhu |
| Don Torrieri | Peter Voltz | Cheng Wenqing | King-Jang Yang | Per Zetterberg | Yuan Zhu |
| Filippo Tosato | Frederick Vook | Philipp Wertz | Lie-Liang Yang | Chunpeng Zhang | Ye Zhuan |
| Ljiljana Trajkovic | Serdar Vural | Henning Wiemann | Yang Yang | Hongyuan Zhang | Jun Zou |
| Velio Tralli | Rama Vuyyuru | Werner Wiesbeck | Kazuto Yano | Jian Zhang | Abdelhak Zoubir |
| Xuan Nam Tran | Achim Wacker | Christian Wietfeld | Liao Yanyan | Jian-Kang Zhang | Phillipo Zuccardi |
| Matteo Trivellato | Lihua Wan | Leif Wilhelmsson | Wenbing Yao | Jin Zhang | Salam Zummo |
| Alicia Triviño | Beibei Wang | Sarah Kate Wilson | Yan Yao | Jinyun Zhang | |
| Shiao-Li Tsao | Bin Wang | Lars Wischhof | Yingwei Yao | Jiucui Zhang | |

Opening Plenary

Monday, 1 October, 8.30 – 9.50 Maryland AED

Influences on Future Research

Nigel Jefferies, Vodafone Group Research & Development
Chair, Wireless World Research Forum

There are many factors which influence the direction of mobile communication research. Amongst these are the demands of industry and the interests of academia. As Chair of the Wireless World Research Forum, and Head of Academic Relationships within Vodafone Group Research & Development, Dr Nigel Jefferies is well placed to give an insight into the factors which affect the direction of research. In addition, Dr Jefferies will introduce the WWRF, and the panel on 'Shaping the Wireless Future through User Oriented Services' taking place on Tuesday.

Dr. Nigel Jefferies is Head of Academic Relationships within Vodafone Group Research & Development and Chairman of the Wireless World Research Forum. In the past he led the European-funded IST project SHAMAN, which is studying the security of future mobile systems, and runs the Secure Applications Steering Group for Mobile VCE. Other collaborative research projects led include 3GS3 in the LINK programme, and



ASPeCT and USECA in the European ACTS programme. His research interests include cryptography, security of systems and applications of mathematics to telecommunications. He received a PhD in functional analysis from Goldsmith's College, London, and an MA in mathematics from the Queen's College, Oxford.

Veena Rawat, President, Communications Research Centre Canada

Another major influence in the direction of research are regulatory regimes. One essential resource required to use vehicular technologies and communication services is radio frequency spectrum. Dr Veena Rawat, President of the Communications Research Centre Canada (CRC) will cover process to access spectrum, development of regulations and some key regulatory issues facing industry. She will also introduce the regulatory panel which will be held on Tuesday.



Dr. Veena Rawat is the President of the Communications Research Centre Canada (CRC). An Agency of Industry Canada, CRC is responsible for conducting applied research and development in communications and related technologies. CRC's R&D program for terrestrial wireless services includes cognitive and software defined radio (SDR), MIMO implementation, EMC issues for UWB and other new wireless services. During her 28 years of experience with Industry Canada in managing programs related to spectrum engineering, Dr. Rawat was involved in policy and standards development for cellular, public safety and other key wireless, broadcasting and satellite services. She led Canadian delegations and negotiations at the International Telecommunications Union, the Organization of American States and with the United

States Government and co-chaired Canada/US Committee to negotiate spectrum use along the border.

Dr. Rawat has chaired many technical committees of Canadian and international organizations that deal with radio, spectrum and telecommunications issues and standards. In 2003, she became the first woman to chair the World Radiocommunication (WRC) Conference of the United Nations' telecommunication organization for which she was awarded a gold medal by the Secretary General of the ITU.

Her work has garnered her much recognition, including the Canadian Women in Communications (CWC) Woman of the Year Award in 2004, International Leadership in Government Award from the Wireless Communications Association International in the U.S. and many others. Dr. Rawat was the first female Ph.D in electrical engineering to graduate in 1973 from Queens University in Kingston, Ontario, Canada

Panels

Monday, October 1, 18.00 – 19.30

Professors' Forum - Wireless Futures

Chair: Lajos Hanzo *University of Southampton, UK*

Panelists:

Gerhard Fettweis *Technische Universitaet Dresden, Germany.*

Ted Rappaport *University of Texas at Austin, USA*

H. Vincent Poor *Princeton University, USA*

Following a period of spectacular growth, basic wireless services have reached a high penetration, although most subscribers still rely on voice and low-rate data communications. This research-oriented panel of academics will embark on speculating on the future directions of the broad field of wireless multimedia communications, with a view to involve you, as fellow researcher in outlining a range of open problems for our community to address.

Professor Lajos Hanzo, FReng, FIEEE, FIET, DSc, graduated with a first-class Master degree in 1976 and in 1983 he was conferred a Phd. During his 30-year career in communications he has held various research and academic posts in Hungary, Germany and the UK. Since 1986 he has been with the School of Electronics and Computer Science, University of Southampton, UK. He currently holds the established Chair of Telecommunications.

Over the years he co-authored 15 IEEE Press / John-Wiley anglo-american books on mobile radio communications totalling in excess of 10 000 pages and published in excess 700 research papers, 492 of which are IEEE publications available at IEEE Xplore. He was awarded a number of distinctions. He is an IEEE Distinguished Lecturer of both the Communications Society and the Vehicular Technology Society. He is also a Governor of both the IEEE Communications as well as of the VT Society. Lajos much enjoys the industrial academic liaison and moderated numerous technical panel discussions over the years.

Professor Gerhard Fettweis earned his Dipl-Ing (1986) and PhD (1990) degrees from Aachen University of Technology (RWTH) in Germany. From 1990 to 1991 he was a Visiting Scientist at the IBM Almaden Research Center in San Jose, CA, working on signal processing for disk drives. From 1991 to 1994 he was with TCSI Inc., Berkeley, CA, responsible for signal processor developments. Since September 1994 he holds the Vodafone Chair at Technische Universitaet Dresden, Germany.

He co-founded Systemonic as CTO, a startup acquired by Philips Semiconductors in 2002. Since 2000 he has co-founded Radioplan, Signalion, In-Circuit, Dresden Silicon, and Freedelity. Gerhard Fettweis serves on numerous advisory industrial and academic boards. Gerhard has organized multiple IEEE Workshops, sessions, has been the General Chair of the 2005 EU IST Mobile Summit in Dresden, and is the TPC Chair of IEEE ICC 2009 in Dresden

Professor Theodore (Ted) Rappaport is the William and Bettye Nowlin Chair in Engineering at the University of Texas at Austin and is the founding director of the Wireless Networking and Communications Group (WNCG). In 1989, he

founded TSR Technologies, Inc., a cellular radio/PCS software radio manufacturer that sold to what is now Andrew Corp in 1993, and in 1995, he founded Wireless Valley Communications Inc., a site-specific radio design and management firm acquired by Motorola in 2005. He also served as a founding advisor to Telephia, which sold to Nielsen in 2007.

Rappaport received an NSF Presidential Faculty Fellowship in 1992, the Sarnoff Citation from the Radio Club of America in 2000, the Fredrick E. Terman Outstanding Electrical Engineering Faculty Award from the ASEE in 2002 and the Stuart F. Meyer Award from the IEEE Vehicular Technology Society in 2005. In 1999, his work on site-specific propagation received the IEEE Communications Society Stephen O. Rice Prize Paper Award. Dr. Rappaport has published numerous papers, patents, and textbooks, is a fellow of the IEEE, and is active in the IEEE Communications and Vehicular Technology societies. He currently serves on the technical advisory boards of iTaggit, Motion Computing, Alereon, Media Excel, Paratek Microwave, and the Federal Communications Commission. He received B.S., M.S. and Ph.D. degrees in electrical engineering from Purdue University in 1982, 1984 and 1987, respectively.

Professor H. Vincent Poor is the Michael Henry Strater University Professor of Electrical Engineering and Dean of the School of Engineering and Applied Science at Princeton University. His primary research interests are in the area of wireless networks and related fields. Among his publications in these areas is the recent book, MIMO Wireless Communications (Cambridge University Press, 2007), co-authored with Ezio Biglieri, et al.

Dr. Poor is a member of the U. S. National Academy of Engineering, a Fellow of the American Academy of Arts & Sciences, and a former Guggenheim Fellow. He is also a Fellow of the IEEE, the Institute of Mathematical Statistics, the Optical Society of America, and other scientific and technical organizations. He is a former President of the IEEE Information Theory Society, and a former Editor-in-Chief of the IEEE Transactions on Information Theory. Recent recognition of his work includes the 2005 IEEE Education Medal and the 2007 IEEE Marconi Prize Paper Award.

Tuesday, October 2, 10.30 – 12.00

Global Regulatory and Policy Issues for Mobile Telecommunications Engineers

Chair: Eric Schimmel *Telecommunications Consultant*
Panelists: Veena Rawat *Communications Research Centre, Canada*
Michael Sharpe *European Telecommunications Standards Institute*
Official from the FCC, USA (to be confirmed)

A panel of policy experts will give status reports on regulatory actions and trends in the major global regions. They will focus on issues which may be useful to telecommunications engineers working on product and system development. Specific topics will include spectrum, emerging technologies, and standardization.

Eric Schimmel is a Senior-Life member of the IEEE VTS and a current member of the Board of Governors. He is the VTS liaison to the International Telecommunications Union, an arm of the United Nations in Geneva, via his leadership of US delegations to meetings on terrestrial mobile radio. He also provides liaison to the IEEE-USA Committee on Communications and Information Policy. Mr. Schimmel is a retired VP of the Telecommunications Industry Association, where he administered policy and technical standards committees. He continues to provide consulting services in

those areas, and is on the Board of Directors of the Space Data Corporation.

Dr. Veena Rawat is the President of the Communications Research Centre Canada (CRC). Her biography can be found on Page 10.

Michael Sharpe received his PhD in the Computer Aided Design research group of the University of Essex in 1989. Since then, he has worked at BBC Television, Ford Motor Company and the UK Radiocommunications Agency before joining ETSI in 1995.

Tuesday, October 2, 10.30 – 12.00

WWRF Panel – Shaping the Wireless Future through User Oriented Services

Chair: Nigel Jefferies *Chair, Wireless World Research Forum;*
Panelists: Klaus David *Chair, WWRF Working Group 2 (Service Architecture)*
Rolf Kraemer *Chair Working Group 5, Short Range Radio Communication Systems*
Josef Noll *University of Oslo*

This panel, involving key group leaders within the Wireless World Research Forum, will address issues including identifying relevant technologies, building a user-centric service environment, and enabling context-aware and personalized services.

Dr. Nigel Jefferies, from Vodafone Group Research & Development, is Chair of the Wireless World Research Forum. His biography can be found on Page 10.

Prof. Klaus David will address aspects of the work of WG2 of the last two years. Especially we will address the topics of innovative services, service architecture, context awareness and personalisation. Additionally Service Creation and new usage scenarios including Car2Car, m-Health, m-Energy will be presented.

Klaus David is full University Professor since 1998 and since 2000 head for the chair of communication technology at the University of Kassel. His research focus is on the Mobile Wireless Internet covering aspects of mobile middleware, context awareness and networking. He has 12 years of industrial experience in major companies like HP, Bell Northern Research, IMEC, T-Mobile (as Head of Group and UMTS project leader) and IHP (as Head of Department), with five years of international experience in the UK, Belgium, USA and Japan. He has more than 120 scientific publications in the field of the Mobile Wireless Internet, including one book and seven patents. He has extensive experiences in EC funded projects since 1987. Since 2006 Klaus David is the chair of the Working Group2 (on Service Architecture) of WWRF.

Prof. Dr. Rolf Kraemer, from IHP GmbH, is Chair of Working Group 5, Short Range Radio Communication Systems. His talk will address aspects of the work of WG5 of

the last two years. Especially we will address the topics of 60GHz, Gigabit communications and aspects of UWB over optical fibre. These two examples should show the innovative aspects and work organisation of the group. Additionally we will introduce some of the new technical topics we will address within the next two years. Especially we will focus on the aspect of robust Car-2-Car communion as an extension of IEEE802.11p. Moreover we will consider ultra high speed communications for wireless LAN like applications going up to 100 Gb/s.

Prof. Josef Noll, University of Oslo will discuss service access in a ubiquitous computing and pervasive Internet environment. This is no longer a question of enabling services for customers, but to design a convenient and trusted service usage. While semantic services open for a description of user preferences, profiles and social groups, privacy handling has not been addressed so far. Social communities based on friend of a friend principles, LinkedIn, or Facebook are open for all registered users, thus data about yourself are spread all-around. The contribution to the panel will address privacy issues in social networks, based on the identity of the user. Focus is on the semantic description of user's role in social networks and on securing the access through appropriate authentication mechanisms. Depending on the security requirements of the user, Internet trust mechanisms or mobile-based key exchange mechanisms can be applied. The user-centric approach will

enable the user to select an identity provider for the trusted management. A prototype using semantically defined social relationships demonstrates the capabilities of the suggested approach.

Prof. stip. Dr. Josef Noll holds a professor stipend from the University of Oslo in the area of Mobile Services. Working areas include Mobile Authentication, Wireless Broadband

Access, Personalised Services, Mobile-Fixed Integration and the Evolution to 4G systems. He is also Senior Advisor in Movation, Norway's leading innovation company for mobile services. Previously he was Senior Advisor at Telenor R&I in the Products and Markets group, and prior to that staff member at the European Space Agency (ESA).

Registration

Registration will take place in the 5th floor Foyer. Hours are:

- | | | | |
|-----------------------|-------------|-----------------------|-------------|
| • Sunday 30 September | 0830 – 1800 | • Tuesday 2 October | 0800 – 1700 |
| • Monday 1 October | 0730 – 1800 | • Wednesday 3 October | 0800 – 1330 |

Breaks

Coffee breaks will take place in the exhibit and poster area in the 5th floor Foyer.

Patrons and Exhibitors

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Social Events

Lunches, which are included in the full registration, will be served in Maryland AEB. You will need the ticket included in your registration packet to gain entry. Light refreshments will be served at the Professors' Forum on Monday evening. This event is open to all attendees.

The reception on the Sunday evening will be held in the Hard Rock Café, 601 East Pratt Street. To reach this venue, exit the hotel on to East Pratt Street. Turn left and walk up East Pratt Street. Cross over East Pratt Street at the World Trade Center and continue left up the street. Look for a large guitar atop a brick factory building – the Hard Rock Café is positioned in the center of the building next to Barnes and Noble. The walk takes approximately ten minutes. Entrance to the reception is also by ticket only, so please remember to bring your tickets.

VTC2007-Fall Technical Sessions

Monday 1 October 2007

Monday 1 October 10.20 – 12.10 Baltimore A

1A: Cellular Network Architectures

Chair: Philippe Martins

- 1. Analytical Other-Cell Interference Characterization over HSUPA-Enabled Multi-cell UMTS Networks**
Tuo Liu (*University of Sydney, Australia*); Andreas Mäder and Dirk Staehle (*University of Wuerzburg, Germany*)
- 2. Spatial Outage Probability Formula for CDMA Networks**
Jean-Marc Kelif (*France Telecom R&D, France*); Marceau Coupechoux, Philippe Godlewski (*ENST & CNRS LTCI UMR 5141, France*)
- 3. Ubiquitous Entity Interactions and Dispatcher Architecture**
Hillary Tarus, John Bush, James Irvine, John Dunlop (*University of Strathclyde, UK*)
- 4. Practical Considerations of HSDPA Performance**
Pablo Tapia, Dan Wellington, Jun Liu and Yasmin Karimli (*T-Mobile USA*)
- 5. Optimizing the Date of an Upgrading Investment in a Data Network**
Frédéric Morlot, Benoit Fourestié, Salah Eddine Elayoubi (*Orange Labs, France*)
- 6. Capacity Planning Service for Radio Access CDMA Networks**
Doru Calin (*Bell Labs, Alcatel-Lucent, USA*); Andrew Mackay (*Alcatel-Lucent, NZ Ltd, New Zealand*); Tom Morawski, Hardy Zhang (*Bell Labs, Alcatel-Lucent, USA*)

Monday 1 October 10.20 – 12.10 Fells Point

1B: Transportation Systems

Chair: Stephan Olariu

- 1. Data Quantity for Reliable Traffic Information in Vehicular Ad hoc Networks**
Hyoungsoo Kim, David J. Lovell (*University of Maryland, USA*); Youn-Soo Kang (*Korea Transport Institute, Korea*); Wonkyu Kim (*Korea Aerospace University, Korea*)
- 2. Performance Evaluation of 802.16e in Vehicle to Vehicle Channels**
Beibei Wang, Indranil Sen, David W. Matolak (*Ohio University, USA*)
- 3. Impacts of Radio Access Protocols on Cooperative Collision Avoidance in Urban Traffic Intersection Scenarios**
Fan Yu and Subir Biswas (*Michigan State University, USA*)
- 4. Multi-user, Time-reversal UWB Communication for Railway Systems**
H. Saghir (*University of Valenciennes, France*); M. Heddebaut and F. Elbahhar (*The French National Institute for Transport and Safety Research (INRETS-LEOST), France*); J.M. Rouvaen and A. Rivenq (*University of Valenciennes, France*)
- 5. Data Stream Processing Infrastructure for Intelligent Transport Systems**
Eric Bouillet, Mark Febowitz, Zhen Liu, Anand Ranganathan, Anton Riabov, Fan Ye, Schuman Shao, Don Schlosnagle (*IBM T. J. Watson Research Center, USA*)

6. Robust and High Data Rate Wireless Link for Security Between a Bus and a Control Centre

Gérald Moniak, Emilie Masson, Hervé Dumortier, Marion Berbineau, (*INRETS-LEOST, France*); Atika Rivenq (*Université de Valenciennes et du Hainaut Cambrésis, France*)

Monday 1 October 10.20 – 12.10 Federal Hill

1C: Ad Hoc Routing Protocols

Chair: TBA

- 1. A Performance Comparison of Position-Based Routing Approaches for Mobile Ad Hoc Networks**
Miguel Garcia de la Fuente (*Robotiker-Tecnalia, Spain*); Houda Ladiod (*Ecole Nationale Supérieure des Télécommunication (ENST), France*)
- 2. A Route Selection Scheme for Multi-Route Coding in Multihop Cellular Networks**
Hiraku Okada (*Niigata University, Japan*); Hitoshi Imai, Takaya Yamazato, Masaaki Katayama (*Nagoya University, Japan*); Kenichi Mase, (*Niigata University, Japan*)
- 3. Hop Distance Based Routing Protocol for MANET**
Filip Cuckov, Min Song (*Old Dominion University, USA*)
- 4. The DYMO Routing Protocol in VANET Scenarios**
Christoph Sommer, Falko Dressler (*University of Erlangen-Nuremberg, Germany*)
- 5. Congestion-Aware Routing Protocol for Mobile Ad Hoc Networks**
Xiaoqin Chen, Haley M. Jones, A. D. S. Jayalath (*The Australian National University, Australia*)
- 6. Secure Position-Based Routing for VANETs**
Charles Harsch, Andreas Festag (*NEC Deutschland GmbH, Germany*); Panos Papadimitratos (*EPFL, Switzerland*)

Monday 1 October 10.20 – 12.10 Homeland

1D: MAC and Frequency Reuse

Chair: Tim Schenk

- 1. High Spectral Efficiency of Multiple-Relays Assisted Amplify-and-Forward Cooperative Transmissions under Spatial Reuse**
Adrian Agustin, Josep Vidal (*Technical University of Catalonia (UPC), Spain*)
- 2. An Intra-Cell Frequency Reuse Plan for Triangular Cell Communication System**
Xingzai Lv, Zhen Wang, Jingkan Zhu (*University of Science and Technology of China, P.R. China*)
- 3. Exploiting Spectral Reuse in Resource Allocation, Scheduling, and Routing for IEEE 802.16 Mesh Networks**
Lien-Wu Chen, Yu-Chee Tseng (*National Chiao-Tung University, Taiwan*); Da-Wei Wang, Jan-Jan Wu (*Academia Sinica, Taiwan*)
- 4. DMABT: A Novel Distributed Medium Access Protocol with Busy Tone**
Mingxin Chen, Gan Liu, Guangxi Zhu, Di Wu, Wenpeng Yuan (*Huazhong University of Science and Technology, P.R. China*)
- 5. A New MAC Protocol of Ad Hoc Networks**
Wenpeng Yuan, Guangxi Zhu, Gan Liu, Di Wu, Mingxin Chen (*Huazhong University of Science and Technology, P.R. China*)
- 6. Cooperative Spatial Reuse with Transmit Beamforming**
Chenguang Lu, Frank H.P. Fitzek, Patrick C.F. Eggers (*Aalborg University, Denmark*)

Monday 1 October 10.20 – 12.10 Guilford

1E: New Measurement Results

Chair: Volker Jungnickel

- 1. Cluster Identification and Properties of Outdoor Wideband MIMO Channel**
Weihui Dong, Jianhua Zhang, Xinyin Gao, Ping Zhang (*Motorola Ltd., USA*); Yufei Wu (*Beijing University of Posts and Telecommunications, China*)
- 2. Measurement and Analysis of the 60 GHz In-Vehicular Broadband Radio Channel**
Michael Peter, Wilhelm Keusgen, Andreas Kortke (*Fraunhofer-Institut für Nachrichtentechnik, Germany*); Martin Schirmacher (*Airbus Deutschland GmbH, Germany*)
- 3. Propagation Characteristics of Polarized Radio Waves in Cellular Communications**
Henrik Asplund, Jan-Erik Berg, Fredrik Harrysson, Jonas Medbo, Mathias Riback (*Ericsson AB, Sweden*)
- 4. Indoor Office Propagation Measurements and Path Loss Models at 5.25 GHz**
Ding Xu, Jianhua Zhang, Xinying Gao, Ping Zhang (*Beijing University of Posts and Telecommunications, USA*); Yufei Wu (*Motorola Ltd., USA*)
- 5. Outdoor Urban Propagation Experiment of a Handset MIMO Antenna with a Human Phantom Located in a Browsing Stance**
Atsushi Yamamoto, Toshiteru Hayashi, Koichi Ogawa (*Matsushita Electric Industrial Co., Ltd., Japan*); Kim Olesen, Jesper Ø. Nielsen, Naizheng Zheng, Gert F. Pedersen (*Aalborg University, Denmark*)
- 6. Dual-Polarized Spatio-Temporal Characterization in Urban Macrocells at 2 GHz**
Albin Dunand, Jean-Marc Conrat (*France Telecom R&D, France*)

Monday 1 October 10.20 – 12.10 Foyer

1Pa: Propagation, Channel Modeling, and Signaling for Multiple Antenna Communication Systems

Chair: TBA

- 1. A Novel Multi-Antenna Based Non-line-of-Sight Error Mitigating Algorithm**
Xiaoxuan Zhu, Mingyang Shi, Xiaoguang Wu (*Beijing University of Posts and Telecommunications, China*); Xiaofeng Tao, Ping Zhang (*Beijing University of Posts and Telecommunications, China*)
- 2. Single-Carrier Space-Frequency Block Coding - Performance Evaluation**
Cristina Ciochina, Damien Castelain, David Mottier (*Mitsubishi Electric, France*); Hikmet Sari (*Supélec, France*)
- 3. A Reliability-Based Detection Algorithm for V-BLAST Systems**
Guoquan Lu, He Wang, Baojin Li, Xin Zhang, Dacheng Yang (*Beijing University of Posts and Telecommunications, China*)
- 4. EXIT Chart Analysis of Iterative Receivers for Space-Time-Frequency Coded OFDM Systems**
Stephan Sand, Simon Plass, Armin Dammann (*German Aerospace Center, Germany*)
- 5. Heterogenous Information Aided Semiblind Group MUD for MIMO MC-CDMA Systems**
Hoang-Yang Lu (*Lee-Ming Institute of Technology, Taiwan, ROC*); Wen-Hsien Fang, Yie-Tarnng Chen and Kuo-Liang Yeh (*National Taiwan University of Science and Technology, Taiwan, ROC*)

6. Multi-user Joint Doppler Spread Estimation in Generalized Distributed Antenna System

Jin Xu, Jing Zhang, Juan Han, Xiaofeng Tao, Lihua Li, Ping Zhang (*Beijing University of Posts and Telecom., P.R. China*)

7. Symmetric Radial Basis Function Assisted Space-Time Equalisation for Multiple Receive-Antenna Aided Systems

S. Chen, S. Liu and L. Hanzo (*University of Southampton, UK*)

8. A Frequency-Domain Equalization Architecture for Space-Time Block Coded MIMO-CDMA Systems

Zhifeng Ruan, Qixing Wang, Baojin Li, Yongyu Chang, Dacheng Yang (*Beijing University of Posts and Telecommunications (BUPT), China*)

9. Impact of Mutual Coupling and Antenna Efficiencies on Adaptive Switching Between MIMO Transmission Strategies

Ramya Bhagavatula, Robert W. Heath Jr. (*The University of Texas at Austin, USA*); Antonio Forenz (*Rearden, LLC, USA*); Daniele Piazza, Kapil Dandekar (*Drexel University, USA*)

10 Adaptive Rotation based Full-Diversity Full-Rate Scheme with Channel State Information

Jooan Kim, Namshik Kim, Hyounkuk Kim, Haelyong Kim (*Information and Communications University (ICU), Korea*); Jaekon Lee (*Telecommunication R & D center SAMSUNG, Korea*); Hyuncheol Park (*Information and Communications University (ICU), Korea*)

Monday 1 October 10.20 – 12.10 Baltimore A

1Pb: Propagation and Multiple Antennas

1. Dynamic Channel Modeling for Static Mobile Terminals in Indoor NLOS Environments

Teruya Fujii and Yoshichika Ohta (*Softbank Telecom Corp., Japan*)

2. Measurement Results at 3.7 GHz in Urban Macrocell Environment

Jae Joon Park, Won Sop Kim, Myung Don Kim, Hyun Kyu Chung (*ETRI, Korea*)

3. Outdoor-Indoor Propagation Characteristics of Peer-to-Peer System at 5.25 GHz

Yang Lu, Jianhua Zhang, Xinying Gao, Ping Zhang (*Beijing University of Posts and Telecommunications, China*); Yufei Wu (*Motorola Ltd, America, USA*)

4. Including Diffuse Multipath Parameters in MIMO Channel Models

Nicolai Czink (*Technische Universität Wien, Austria, and Forschungszentrum Telekommunikation Wien (ftw.), Austria*); Andreas Richter (*University of Helsinki, Finland*); Ernst Bonek (*Technische Universität Wien, Austria*); Jukka-Pekka Nuutinen, Juha Ylitalo (*Elektrobit, Finland*)

5. 5.8 GHz Fixed WiMAX Performance in A Sea Port Environment

J. Joe, S.K. Hazra, S.H. Toh, W.M. Tan, J. Shankar (*Institute for Infocomm Research, Singapore*)

6. A Dynamic Propagation Prediction Platform over Irregular Terrain and Buildings for Wireless Communications

Pedro Vieira (*Lisbon Polytechnic Institute and Technical University of Lisbon, Portugal*); Paula Queluz, António Rodrigues (*Technical University of Lisbon, Portugal*)

7. A Path Shadowing Model focused on the Effects of Human Activities in Indoor Environments

Ippei Kashiwagi and Tokio Taga (*Kwansei Gakuin University, Japan*); Tetsuro Imai (*NTT DoCoMo, Inc., Japan*)

8. Developing the Best 2.4 GHz Propagation Model from Active Network Measurements

Lorne C. Liechty (*Georgia Institute of Technology, USA*); Eric Reifsnider (*Motorola, USA*); Greg Durgin (*Georgia Institute of Technology, USA*)

9. Time-Division Multiplexing based MIMO Channel Sounder using Loosely Synchronous Codes

Wonsop Kim, Jae Joon Park, Myung-Don Kim, Hyun Kyu Chung (*Electronics and Telecommunications Research Institute, Korea*)

10 Objective Metric for Antenna Patterns Comparison Using Mahalanobis-Taguchi-Gram-Schmidt Method

Arthur Bekaryan, Hyok J. Song, H.P. Hsu, Jim Schaffner (*HRL Laboratories, LLC, USA*); Richard Wiese (*General Motors Corporation, USA*)

Monday 1 October 13.30 – 15.20 Baltimore A

2A: Scheduling and Power Control

Chair: TBA

1. Energy-Optimized Low-Complexity Control of Power and Rate in Clustered CDMA Sensor Networks with Multirate Constraints

Chun-Hung Liu (*The University of Texas at Austin, USA*)

2. Automated Up- and Downlink Capacity Balancing in WCDMA Networks

Mario García-Lozano, Oriol Sallent, Jordi Pérez-Romero (*Technical University of Catalonia, Spain*); Álvaro Gomes (*Portugal Telecom Inovação, Portugal*); Pedro M. d'Orey (*Instituto de Telecomunicações, Portugal*); Silvia Ruiz (*Technical University of Catalonia, Spain*)

3. Power Fairness in A Scalable Ring-based Wireless Mesh Network

Jane-Hwa Huang, Li-Chun Wang, and Chung-Ju Chang (*National Chiao-Tung University, Taiwan, R.O.C.*)

4. A Novel Frequency Reuse Scheme for Multi-Cell OFDMA Systems

Haipeng Lei, Xin Zhang, and Dacheng Yang (*Beijing University of Posts and Telecommunications, P.R. China*)

5. A Distributed Node Scheduling Protocol Considering Sensing Coverage in Wireless Sensor Networks

Jaekyu Cho, Gilsoo Kim, Taekyoung Kwon, Yanghee Choi (*Seoul National University, Korea*)

6. Uplink Power Control for an OFDMA Mobile Cellular System

Lai King Tee (*Samsung, USA*)

Monday 1 October 13.30 – 15.20 Fells Point

2B: Multi User MIMO I

Chair: Jayakrishnan Mundarath

1. MBER Turbo Multiuser Beamforming Aided QPSK Receiver Design Using EXIT Chart Analysis

Shuang Tan, Sheng Chen, Lajos Hanzo (*University of Southampton, UK*)

2. Multiuser Detection Method for Single-Carrier Transmission in Uplink Multiuser MIMO Access

Koichi Ishihara, Yasushi Takatori, and Shuji Kubota (*NTT Corporation, Japan*)

3. Effect of Line-of-Sight on Dual-Hop Nonregenerative Relay Wireless Communications

Trung Q. Duong, Hyundong Shin, Een-Kee Hong (*Kyung Hee University, Korea*)

4. EXIT Chart Analysis of Low-Complexity Bayesian Turbo Multiuser Detection for Rank-Deficient Multiple Antenna Aided OFDM

Lei Xu, Sheng Chen and Lajos Hanzo (*University of Southampton, UK*)

5. Discrete Power Allocation for Lifetime Maximization in Cooperative Networks

Wan-Jen Huang (*University of Southern California - Los Angeles, USA*); Yao-Win Hong (*National Tsing Hua University, Taiwan*); C.-C. Jay Kuo (*University of Southern California - Los Angeles, USA*)

6. Space-Time Trellis Coding Exploiting Superimposed Transmissions in Half-Duplex Relay Networks

Peter Rost, Gerhard Fettweis (*Technische Universität Dresden, Germany*)

Monday 1 October 13.30 – 15.20 Federal Hill

2C: Channel and Source Coding

Chair: Rodney Vaughan

1. Tail-Biting LDPC Convolutional Codes Based on Protographs

Marcos B.S. Tavares (*Technische Universität Dresden, Germany*); Kamil Sh. Zigangirov (*University of Notre Dame, USA*); Gerhard P. Fettweis (*Technische Universität Dresden, Germany*)

2. Design of Rate-Compatible Irregular LDPC Codes Based on Edge Growth and Parity Splitting

Noah Jacobsen and Robert Soni (*Alcatel-Lucent, USA*)

3. Routing Metrics Based on Soft-Output Decoding

Justus Ch. Fricke, Muhammad Irfan Rafique, and Peter A. Hoeher (*University of Kiel, Germany*)

4. Performance Bounds on Turbo Coded Hybrid ARQ

Tao Shi and Lei Cao (*University of Mississippi, USA*)

5. A Tail-biting Turbo Coded OFDM System for PAPR and BER Reduction

Yung-Chih Tsai (*National Taiwan University, Taiwan, R.O.C.*); Yeong-Luh Ueng (*National Tsing Hua University, Taiwan, R.O.C.*)

6. Joint Optimization of Iterative Source and Channel Decoding Using Over-Complete Source-Mapping

A.Q. Pham, L.L. Yang, and L. Hanzo (*University of Southampton, UK*)

Monday 1 October 13.30 – 15.20 Homeland

2D: OFDM Systems: Interference Mitigation

Chair: Dinesh Rajan

1. Soft Decoding Assisted Interference Cancellation in a Non-binary LDPC Coded Fast Frequency Hopping Multiuser System Using Product Combining

Sohail Ahmed, Lie-Liang Yang, Lajos Hanzo and Feng Guo (*University of Southampton, UK*)

2. Inter-Cell Interference Coordination/Avoidance for Frequency Reuse by Resource Scheduling in an OFDM-based Cellular System

Seok Ho Won, Hyeong Jun Park (*ETRI, Korea*); James O. Neel (*Cognitive Radio Technologies, USA*); Jeffrey H. Reed (*MPRG, Virginia Tech., USA*)

3. Interference Power Based Uplink Admission Control in Enhanced WCDMA

Erik Geijer Lundin, Patrik Karlsson, Stephen Craig (*Ericsson, USA*)

4. Interference Analysis and Sensing Threshold of Detect and Avoid (DAA) for UWB Coexistence with WiMax

Kwan-woo Kim, Jongmin Park, Jinyoun Cho, Kyutae Lim (*Georgia Institute of Technology, USA*); Charles J. Razzell, (*NXP Semiconductor, USA*); Kihong Kim (*Samsung Electro-Mechanics Inc, Korea*); Chang-ho Lee (*Samsung RFIC Design Center at Georgia Tech, USA*); Haksun Kim (*Hanbat National University, Korea*); Joy Laskar (*Georgia Institute of Technology, USA*)

5. On Distributed and Self-Organized Inter-cell Interference Mitigation for OFDMA Downlink in IMT-Advanced Radio Systems

Xiaoben He (*Nokia Siemens Networks, Finland*); Valkealahti Kimmo (*Nokia Research Center, Finland*)

6. Local Interference Coordination in Cellular OFDMA Networks

Marc C. Necker (*University of Stuttgart, Germany*)

Monday 1 October 13.30 – 15.20 Guilford

2E: Tools for Measurements and Network Planning

Chair: Nikolai Czink

1. An Improved SOS-based Fading Channel Emulator

Amirhossein Alimohammad, Saeed Fouladi Fard, Bruce F. Cockburn, Christian Schlegel (*University of Alberta, Canada*)

2. Antenna Arrays Design and Calibration for High Resolution MIMO Channel Sounding at 3.5 GHz

Hanna Farhat, Ghais El Zein (*Institute of Electronics and Telecommunications of Rennes, France*)

3. Propagation Model and Network Simulator for Stationary and Nomadic WiMAX Networks

René Wahl, Oliver Stähler, Gerd Wölfle (*AWE Communications GmbH, Germany*)

4. Characterization of the ORBIT Indoor Testbed Radio Environment

Haris Kremos, Jing Lei, Ivan Šeškar, Larry Greenstein, Predrag Spasojević (*Rutgers University, USA*)

5. On the Parallelization of Radio Network Planning Tools

Salah Eddine Elayoubi, Benoît Fourestié, Patricia Layec (*Orange Labs, France*)

6. Estimation of Exclusion Zones for Base Station Antennas in Wireless Communications Systems

Carla Oliveira, Carlos C. Fernandes, Luís M. Correia (*Instituto de Telecomunicações/Instituto Superior Técnico, Portugal*)

Monday 1 October 13.30 – 15.20 Foyer

2P: Ad Hoc Wireless Networks

Chair: Filip Cuckov

1. Realistic Energy Evaluation in Ad Hoc Networks

Alberto Bisello, Alessandra Giovanardi, Gianluca Mazzini (*University of Ferrara, Italy*)

2. MAC Schemes for Ad-hoc Wireless Networks

Valeria Loscri (*University of Calabria, Italy*)

3. Performance Analysis of Decentralized RAN (Radio Access Network) Discovery Schemes for IEEE 802.21

Cheoleun Moon (*KAIST, South Korea*); Sookhyun Yang (*LG Electronics Inc., South Korea*); Ikjun Yeom (*KAIST, South Korea*)

4. A Stability-based Overlay Multicast for Mobile Ad Hoc Networks

Fucaai Yu, Soochang Park, Younghwan Choi, Donghun Lee, Euisin Lee, Ye Tian and Sang-Ha Kim (*Chungnam National University, Korea*)

5. CDMA Relaying in Multiple Frequency Schemes in a Manhattan Environment

Konstantinos Konstantinou, Costas Tzaras (*University of Surrey, Australia*)

6. An Efficient Flow Control and Medium Access in Multihop Ad Hoc Networks with Multi-Channels

Wen-Tsuen Chen, Jen-Chu Liu, Chun-Chieh Chang (*National Tsing-Hua University, Taiwan, R.O.C.*)

7. Performance Evaluation of Party Protocol

Ghazi Al Sukkar, Mehdi Sabeur, Hossam Affi, Badii Jouaber, Djamel Zeglache (*Institut National des Telecommunications, France*); Sidi-Mohammed Senouci (*France Telecom R&D, France*)

8. A Distributed Procedure for Carrier Sensing Threshold Adaptation in CSMA-based Mobile Ad Hoc Networks

Benedito J.B. Fonseca Jr (*Motorola Labs, USA*)

9. Performance Analysis of Wireless Relaying Networks Using Asymmetric Relay Path

Sung-gook Lim, Eunhyun Kwon, Hun-je Yeon, Jaiyong Lee (*Yonsei University, Korea*); Mi-Sun Do, Rakesh Taori (*Samsung AIT, Korea*)

10 Wireless Sensor Nodes Dimensioning under Network Lifetime Constraint

Moez Esseghir and Guy Pujolle (*University of Paris 6, France*)

11 An Efficient Relay Selection Algorithm for Cooperative Networks

Kyu-Sung Hwang and Young-Chai Ko (*Korea University-Seoul, Korea*)

12 Beaconless Location-Based Routing with Signal Strength Assisted for Ad-Hoc Networks

Guowei Chen, Takuro Sato (*Waseda University, Japan*); Kenichi Itoh (*Niigata Institute of Technology, Japan*)

13 New CDMA-Based MAC Protocol for Ad Hoc Networks

Thamer Al-Meshadany, Wessam Ajib (*Universite du Quebec a Montreal, Canada*)

Monday 1 October 15.50 – 17.20 Baltimore A

3A: Medium Access Control

Chair: TBA

1. Access Mechanism for Multihop Cellular Networks

G. Kannan, S.N. Merchant and U.B. Desai (*IIT Bombay, India*)

2. Piggybacking Scheme of MAP IE for Minimizing MAC Overhead in the IEEE 802.16e OFDMA Systems

JuYeop Kim, and Dong-Ho Cho (*Korea Advanced Institute of Science and Technology (KAIST), Korea*)

3. Packet Centric vs. Radio Centric Link Layer Approaches: A Quantitative Analysis

Francesco Rossetto (*University of Padova, Italy*); Michael Meyer (*Ericsson GmbH, Germany*); Michele Zorzi (*University of Padova, Italy*)

4. Performance Evaluation of A Multiuser Detection Based MAC Design for Ad Hoc Networks

Jinfang Zhang, Zbigniew Dziong, Francois Gagnon and Michel Kadoch (*Ecole de Technologie Supérieure, Canada*)

5. Improving Network Capacity by Delegate Polling Hybrid Access Protocol in non-Infrastructure WLANs

Di Wu, Guangxi Zhu, Gan Liu, Wengpeng Yuan, Mingxin Chen (*Huazhong University of Science and Technology, P.R. China*)

Monday 1 October 15.50 – 17.20 Fells Point

3B: Multi User MIMO II

Chair: Murat Uysal

- 1. Non-Collaborative Zero-Forcing Beamforming in the Presence of Co-Channel Interference and Spatially Correlated Channels**
J.H. Kotecha and J.C. Munderath (*Freescale Semiconductor Inc., USA*)
- 2. On Sum Rate of Multi-User Distributed Antenna System with Circular Antenna Layout**
Jiansong Gan, Yunzhou Li, Shidong Zhou and Jing Wang (*Tsinghua University, P.R. China*)
- 3. An Improved Norm-based User Selection Algorithm for Multiuser MIMO Systems with Block Diagonalization**
Zhu Youtuan, Tang Zhihua, Zhu Jinkang (*University of Science and Technology of China, P.R. China*)
- 4. Opportunistic Feedback Protocol for Achieving Sum-Capacity of the MIMO Broadcast Channel**
Rajiv Agarwal, Chan-Soo Hwang and John Cioffi (*Stanford University, USA*)
- 5. Enhanced Lattice-Reduction-Based Precoder with List Quantizer in Broadcast Channel**
Sooyoung Hur, Namshik Kim, Hyuncheol Park and Joonhyuk Kang (*Information and Communications University (ICU), Korea*)

Monday 1 October 15.50 – 17.20 Federal Hill

3C: Synchronization

Chair: Lajos Hanzo

- 1. OFDM Symbol Synchronization Using Frequency Domain Pilots in Time Domain**
Alessio Filippi, Semih Serbetli (*Philips Research, The Netherlands*)
- 2. Successive Maximum Likelihood Estimation for Time and Frequency Synchronization**
Yingming Tsai and Guodong Zhang (*InterDigital Communications Corporation, USA*); Xiaodong Wang (*Columbia University, USA*)
- 3. Comparison of Non-Data-Aided Feedforward Symbol Timing Estimation with “Better Than” Raised Cosine and Raised Cosine Pulse Shapings**
Seung Joon Lee (*Electronics & Telecommunications Research Institute, Korea*); Norman C. Beaulieu (*University of Alberta, Canada*)
- 4. Investigations of Synchronization Channel Sequences in OFDM Based Evolved UTRA Downlink**
Satoshi Nagata, Yoshihisa Kishiyama, Motohiro Tanno (*NTT DoCoMo, Inc., Japan*); Kenichi Higuchi (*Tokyo University of Science, Japan*); Mamoru Sawahashi (*Musashi Institute of Technology, Japan*)
- 5. Joint Symbol Timing Recovery and Equalization for Short Burst Transmissions**
Pietro Savazzi, Paolo Gamba, Lorenzo Favalli (*Università degli Studi di Pavia, Italy*)

Monday 1 October 15.50 – 17.20 Homeland

3D: OFDM Systems: Resource Allocation

Chair: Marc Necker

- 1. Proportional Resource Partitioning over Shared Wireless Links**
Kamal D. Singh (*IRISA / Université de Rennes 1, France*); David Ros, Laurent Toutain (*GET / ENST Bretagne, France*); César Vihó (*IRISA / Université de Rennes 1, France*)

2. Suitability-based Subcarrier Allocation for Multicast Services Employing Layered Video Coding in Wireless OFDM Systems

Seoshin Kwack, Hanbyeol Seo, and Byeong Gi Lee (*Seoul National University, Korea*)

3. Uplink Rate and Power Allocation at Mobile Stations for Multimedia Services

Koudjo M. Koumadi, Khan Sohaib, Weston Chirwa, and Youngnam Han (*Information and Communications University (ICU), South Korea*)

4. On the Rate and Power Allocation for MIMO based Integrated Voice and Data Transmission

Lay Teen Ong, Sangarapillai Lambotharan (*Cardiff University, UK*)

5. An Iterative Resource Allocation Algorithm for Cooperative Multimedia Communications

Yuan-Bin Lin, Tai-Hsiang Chiu, Yu T. Su, and M.S. Kao (*National Chiao Tung University, Taiwan*)

Monday 1 October 15.50 – 17.20 Guilford

3E: Channel Modelling

Chair: John D. Hobby

1. Controlling the Stationary Distribution of Mobile Users in Wireless Network Simulations

Jan Kraaier, Ulrich Killat (*Hamburg University of Technology, Germany*)

2. Channel Analysis for an OFDM-MISO Train Communications System Using Different Antennas

Sandra Knörzer, Michael A. Baldauf, Thomas Fügen, Werner Wiesbeck (*Universität Karlsruhe (TH), Germany*)

3. Fade Slope Analysis of Ka-band LEO Satellite Links

Weiwien Liu, Boubacar Diallo, and David G. Michelson (*University of British Columbia, Canada*)

4. A Model for Time-Efficient HSDPA Simulations

Dirk Staehle and Andreas Mäder (*University of Würzburg, Germany*)

5. Clustering of Scatterers over an Irregular Clutter Environment: An Extension of COST 273 MIMO Channel Model

Pedro Vieira (*Lisbon Polytechnic Institute and Technical University of Lisbon, Portugal*); Paula Queluz, António Rodrigues (*Technical University of Lisbon, Portugal*)

Monday 1 October 15.50 – 17.20 Foyer

3P: CDMA and Spread Spectrum I

Chair: Yu Ted Su

1. Ant-Colony-Based Multiuser Detection for MC DS-CDMA Systems

Chong Xu, Lie-Liang Yang and Lajos Hanzo (*University of Southampton, UK*)

2. LDPC-coded HARQ Throughput Performance of MC-CDMA using ICI Cancellation

Kaoru Fukuda, Akinori Nakajima and Fumiyuki Adachi (*Tohoku University, Japan*)

3. A Power-controlled 2-dimensional Block Spread DSCDMA Cellular System with Uplink Site Selection Diversity

Le Liu, Fumiyuki Adachi (*Tohoku University, Japan*)

4. A Novel Chase Based Multiuser Detector for MIMO-CDMA Systems

Liu Feng and M. Reza Soleymani (*Concordia University, Canada*)

- 5. Performance Analysis of Multiuser Transmission with Adaptive Antenna Arrays using Spatial Classes**
Jiang Zheng, Liao Yanyan, Zhang Yan, Yang Dacheng, Zhang Xin (Beijing University of Posts and Telecommunications, P.R. China)
- 6. A Novel Multiple Input Multiple Output Transceiver for Ultra-Wideband Technology**
Yue Xia Zhang, Xiaofeng Tao, Qimei Cui, Ping Zhang (Beijing University of Posts & Telecommunications, P.R. China)
- 7. An Adaptive Admission Control Strategy for WCDMA Multicellular Networks with Nonuniform Traffic**
Panagiotis Gkonis (National Technical University of Athens, Greece); George Tsoulos (University of Peloponnese, Greece); Dimitra Kakkamani (National Technical University of Athens, Greece)
- 8. A Novel User Grouping Scheme for PAPR Reduction in MC-CDMA System**
Lilin Dan, Qingsong Wen, Yue Xiao and Shaoqian Li (University of Electronic Science and Technology of China, P.R. China)

- 9. Uplink Capacity of Single-carrier Frequency - interleaved Spread Spectrum Multiple Access**
Kazuaki Takeda, Fumiyuki Adachi (Tohoku University, Japan)
- 10 Single-User Performance of Relay-Assisted DS-CDMA with Power Allocation and Inter-Relay Interference Suppression**
Wei Fang, Lie-Liang Yang, Lajos Hanzo (University of Southampton, UK)
- 11A Novel Quadrature PN De-spreading Method in EBCMCS with Lower Complexity**
Jiao Wu, Guo-ping Xu, Yong Zhang, Xin Zhang (Beijing University of Posts and Telecommunications, P.R. China); Xin Yu (ZTE Corporation, P.R. China)
- 12 Channel Estimation for SIR Measurement in HSDPA Systems**
Akira Ito and Masahiko Shimizu (Fujitsu Laboratories Ltd., Japan)
- 13 Link-Level Evaluations of Low Rate Code Extensions of Turbo Codes Using Shortened Code Techniques**
Shunji Miyazaki and Kazuhisa Ohbuchi (Fujitsu Laboratories Ltd., Japan)

Tuesday 2 October 2007

Tuesday 2 October 8.30 – 10.00 Baltimore A

4A: Sensor Networks

Chair: Nagaraja Thanthy

- 1. Detecting Movement of Beacons in Location-Tracking Wireless Sensor Networks**
Sheng-Po Kuo, Hsiao-Ju Kuo (National Chiao-Tung University, Taiwan); Yu-Chee Tseng (National Chiao-Tung University and Chung-Yuan Christian University, Taiwan); Yueh-Feng Lee (Industrial Technology Research Institute, Taiwan)
- 2. Power Efficient Analog Forwarding for Correlated Data Fusion in Wireless Sensor Networks**
Thakshila Wimalajeewa and Sudharman K. Jayaweera (University of New Mexico, USA)
- 3. Distributed Sequential Event-Region Detection in Sensor Networks**
Tsang-Yi Wang (National Sun Yat-sen University, Taiwan); Qi Cheng (Oklahoma State University, USA)
- 4. A V-BLAST Based Virtual MIMO Transmission Scheme for Sensor Network Lifetime Maximization**
Kanru Xu, Diana Chizuni, Wenqing Cheng, Z. Feng and P. Zhou (Huazhong University of Science and Technology, P.R. China)
- 5. Fault-tolerant and Load Balancing Localization of Services in Wireless Sensor Networks**
Francesco Nidito (Università di Pisa, Italy); Michele Battelli (Google, Inc., USA); Stefano Basagni (Northeastern University, USA)

Tuesday 2 October 8.30 – 10.00 Fells Point

4B: MIMO Cellular

Chair: Hyuckjae Lee

- 1. Uplink Multi-User MIMO OFDM Enhancement Using Genetically Improved Turbo Receiver**
Ming Jiang, Thierry Lestable and Youngkwon Cho (Samsung Electronics Research Institute, UK)
- 2. On Cellular MIMO Spectrum Efficiency**
Koichi Adachi (Keio University, Japan); Fumiyuki Adachi (Tohoku University, Japan); Masao Nakagawa (Keio University, Japan)

- 3. Joint Optimization of the Transmit Antenna Array Geometry and Linear Precoding for MIMO Systems**
Kambiz C. Zangi, Leonid G. Krasny, and Dennis Hui (Ericsson Research, USA)
- 4. System Layer Evaluation of Joint Detection and Imperfect Adaptive Beam-forming Antenna for Packet Services in the LCR TD-CDMA System**
Cui Jie, Chen Bo, He Da-jiang, Chang Yong-yu, Yang Dacheng, (Beijing University of Posts and Telecommunications, China)
- 5. Efficiency of Transmission Techniques in Multiple-Input Single-Output (MISO) Communication System**
Galina Kravtsova, Yuri Karpitski (Kodofon, Russia); Daeyoung Park, JooHyun Yi (Samsung Telecommunications, Korea)

Tuesday 2 October 8.30 – 10.00 Federal Hill

4C: Modulation and Coding

Chair: Matthew Valenti

- 1. The BICM Capacity of Coherent Continuous-Phase Frequency Shift Keying**
Rohit Iyer Seshadri, Shi Cheng and Matthew C. Valenti (West Virginia University, USA)
- 2. Iteratively Detected Irregular Variable Length Coding and Sphere-Packing Modulation-Aided Differential Space-Time Spreading**
Mohammed El-Hajjar, Robert G. Maunder, Osamah Alamri, Soon X. Ng and Lajos Hanzo (University of Southampton, UK)
- 3. Maximum Likelihood Ratio Spectrum Detection Model for Multicarrier Modulation Based Cognitive Radio Systems**
Tao Luo (Beijing University of Posts and Telecommunications, China, and University of Michigan-Dearborn, USA); Weidong Xiang, Tao Jiang (University of Michigan-Dearborn, USA); Zhigang Wen (Beijing University of Posts and Telecommunications, China)
- 4. Factor Graph Framework for Serially Concatenated Coded CPM with Limiter Phase Discriminator Receiver**
Jan Sykora (Czech Technical University in Prague, Czech Republic)

5. A Fast-Convergence Decoding Method and Memory-Efficient VLSI Decoder Architecture for Irregular LDPC Codes in the IEEE 802.16e Standards

Yeong-Luh Ueng, Chung-Chao Cheng (*National Tsing Hua University, Taiwan, R.O.C.*)

Tuesday 2 October 8.30 – 10.00 Homeland

4D: OFDM Systems: Scheduling and Channel Assignment

Chair: Istvan Kovacs

- 1. A Novel Subcarrier Allocation Algorithm for Multiuser OFDM System With Fairness: User's Perspective**
Sanam Sadr, Alagan Anpalagan and Kaamran Raahemifar (*Ryerson University, Canada*)
- 2. Optimal Diversity Multiplexing Tradeoff Region in Asymmetric Multiple Access Channels**
Kaushik Josiam, Dinesh Rajan and M.D. Srinath (*Southern Methodist University, USA*)
- 3. A Packet-by-Packet Scheduling Algorithm in Wireless Multimedia Systems**
Jinyoung Oh, Jin-Yup Hwang, and Youngnam Han (*Information and Communications University (ICU), Korea*)
- 4. A Competitive Fair Subchannel Allocation for OFDMA System Using an Auction Algorithm**
Sang-wook Han and Youngnam Han (*Information and Communications University, Korea*)
- 5. Frequency Domain Scheduling for OFDMA with Limited and Noisy Channel Feedback**
Klaus I. Pedersen (*Nokia Siemens Networks, Finland*); Guillaume Monghal (*Aalborg University, Denmark*); István Z. Kovács, Troels E. Kolding (*Nokia Siemens Networks, Finland*); Akhilesh Pokhariyal (*Aalborg University, Denmark*); Frank Frederiksen, Preben Mogensen (*Nokia Siemens Networks, Finland*)

Tuesday 2 October 8.30 – 10.00 Guilford

4E: Applications and Modelling

Chair: Wilhelm Keusgen

- 1. Impact of Inter-Vehicular Interference on the Performance of Tire Pressure Monitoring Systems**
Vikas Kukshya, Hyok J. Song, Hui P. Hsu (*HRL Laboratories LLC, USA*); Richard W. Wiese (*General Motors Corporation, USA*)
- 2. Combined Markov Model for Packet Loss Characterization in UMTS Channels**
Victor Gomis, Julián Cabrera, Juan C. Plaza, and Fernando Jaureguizar (*Universidad Politécnica de Madrid, Spain*)
- 3. Interference Analysis of 802.11b and 802.11g Wireless Systems**
Santosh Kawade, Terry G. Hodgkinson, Viraj Abhayawardhana (*British Telecom's Mobility Research Centre, UK*)
- 4. Mobile Positioning in MIMO System Using Particle Filtering**
Svetlana Bizjajeva, Tobias Rydén, Ove Edfors (*Lund University, Sweden*)
- 5. Modeling UpLink Power Control with Outage Probabilities**
Kenneth L. Clarkson (*IBM Research, USA*); K. Georg Hampel, John D. Hobby (*Bell Laboratories, Alcatel-Lucent, USA*)

Tuesday 2 October 8.30 – 10.00 Kent

4F: Intelligent Transportation Systems

Chair: Jozef J. Pawelec

- 1. A Novel Approach to Reduce Traffic Chaos in Emergency and Evacuation Scenarios**
Syed R. Rizvi, Stephan Olariu, Michele C. Weigle, Mona E. Rizvi (*Old Dominion University, USA*)
- 2. Collision Warning System on a Curved Road using Wireless Sensor Networks**
KyungBok Sung, JaeJun Yoo, DoHyun Kim (*Telematics-USN Research Division, Korea*)
- 3. AutoCast: An Adaptive Data Dissemination Protocol for Traffic Information Systems**
Axel Wegener, Horst Hellbrück and Stefan Fischer (*University of Lübeck, Germany*); Christiane Schmidt, Sándor Fekete (*Braunschweig University of Technology, Germany*)
- 4. New TTI Value-Added Services Converged over a Hybrid-network**
Soonchoul Kim, Youngho Jeong, Geon Kim, Chunghyun Ahn, Sooin Lee (*Broadcasting Systems Research Group, ETRI, Korea*)
- 5. Unsaturated Performance of IEEE 802.11 Broadcast Service in Vehicle-to-Vehicle Networks**
Xiaomin Ma (*Oral Roberts University, USA*); Xianbo Chen, Hazem H. Refai (*University of Oklahoma, USA*)

Tuesday 2 October 8.30 – 10.00 Baltimore B

4G: WLAN and WiMax

Chair: TBA

- 1. Bandwidth Allocation and Recovery for Uplink Access in IEEE 802.16 Broadband Wireless Networks**
Zi-Tsan Chou, Yu-Hsiang Lin (*Institute for Information Industry, Taiwan*)
- 2. Performance Evaluation of Piggyback Requests in IEEE 802.16**
Rastin Pries, Dirk Staehle, Daniel Marsico (*University of Würzburg, Germany*)
- 3. Saturation Performance of IEEE 802.11 Broadcast Scheme in Ad Hoc Wireless LANs**
Xianbo Chen, Hazem H. Refai (*University of Oklahoma, USA*); Xiaomin Ma (*Oral Roberts University, USA*)
- 4. Enhancement of IEEE 802.16 WirelessMAN Ranging Performance with EIED Backoff Algorithm**
Byung-Jae Kwak (*ETRI, Korea*); Nah-Oak Song (*MMPC, KAIST, Korea*); Dong Seung Kwon (*ETRI, Korea*)
- 5. A New Class Partitioned Discrete Model for the Characterization of RTP Multicast Transmission through IEEE 802.11 Channels**
Juan C. Plaza, Julián Cabrera, Fernando Jaureguizar, and Narciso García (*Universidad Politécnica de Madrid, Spain*)

Tuesday 2 October 8.30 – 10.00 Foyer

4P: Infrastructured Wireless Networks

Chair: TBA

- 1. Performance Analysis of Cooperative MAC in IEEE 802.11n for Multiclass Traffic**
David Tung Chong Wong, Mangalam Ramakrishnan Shajan, Ying-Chang Liang and Francois Po Shin Chin (*Institute for Infocomm Research, A*STAR, Singapore*)
- 2. A Study on End-to-End QoS Provision for Multimedia Services in Beyond 3G Convergence Networks**
Sung Gu Choi (*ETRI, Korea*); Kyung Koo Jun (*University of Incheon, Korea*); Yeon Seung Shin (*ETRI, Korea*)

3. Cooperative ARQ with Phase Pre-compensation

Hyunwoo Choi and Jae Hong Lee (*Seoul National University, Korea*)

4. Impact of a Radio Access Network Capacity on the HSDPA Link Performance

Xinzhi Yan, Jamil Y. Khan (*The University of Newcastle, Australia*); Brendan Jones (*SingTel OPTUS, Australia*)

5. Coexistence Analysis Involving 3GPP Long Term Evolution

Xiang Chen, Xiaowei Jin, Prakash Moorut, Robert Love, Yakun Sun, Weimin Xiao, Amitava Ghosh, and Edgar Fernandes (*Motorola Inc., USA*)

6. Analysis of Non-Saturation and Saturation Performance of IEEE 802.11 DCF in the Presence of Hidden Stations

Fu-Yi Hung and Ivan Marsic (*Rutgers University, USA*)

7. Random Linear Coding for File Sharing in Upload-limited Wireless Packet Networks

J.Y. Wang (*Beijing University of Posts and Telecommunications, and Xiangtan University, China*); G. Yang, X.H Lin, Z.Q. He, J.R. Lin (*Beijing University of Posts and Telecommunications, China*)

8. Precomputed Routing in a Store and Forward Satellite Constellation

Hugo Cruz-Sánchez and Laurent Franck (*ENST-Bretagne Site de Toulouse, France*); André-Luc Beylot (*ENSEEIH, IRIT, France*)

9. Adaptive FEC Reliable Multicast MAC Protocol for WLANs

Anas Basalamah and Takuro Sato (*Waseda University, Japan*)

10 Packet Error Rate and Latency Requirements for a Mobile Wireless Access System in an IP Network

Lai King Tee, (*Samsung, USA*)

Tuesday 2 October 10.30 – 12.00 Foyer

5P: OFDM I

Chair: Alexander Wyglinski

1. Improved Precoding-Assisted Blind Channel Estimation Scheme for OFDM Systems

Bangwon Seo and Hyun Gyu Chung (*Electronics and Telecommunications Research Institute (ETRI), Korea*)

2. Modified Dummy Sequence Insertion Method for PAPR Reduction of OFDM Signal

Jae-Kwon Lee, Jeong-Sang Park, Jin-Up Kim (*Electronics and Telecommunications Research Institute, Korea*)

3. A Novel Method to Design Phase Factor for PTS Based on Pseudo-Random Sub-block Partition in OFDM System

Xia Lei, Yue Xiao, Youxi Tang, Shaoqian Li (*University of Electronic Science and Technology of China, China*)

4. Multicarrier Transmission Peak-to-Average Power Reduction Using Redundant Bit Scrambling

Jae-Kwon Lee (*University of Science and Technology & Electronics and Telecommunications Research Institute, Korea*); Bong-Guk Yu, Jin-Up Kim (*Electronics and Telecommunications Research Institute, Korea*)

5. DSP Design of Channel Estimation in MIMO-OFDM System

Mu Xiao Ting, Zhou Ming Yu, Yang Bing, Tao Xiao Feng (*Beijing University of Posts and Telecommunications, China*)

6. Decimation-in-Time FFT Subblocking for Partial Transmit Sequence OFDM

A. Ghassemi, T.A. Gulliver (*University of Victoria, Canada*)

7. The Application of EESM and MI-based Link Quality Models for Rate Compatible LDPC Codes

Xiang Chen, Zhenyuan Gao, Zesong Fei, Jingming Kuang (*Beijing Institute of Technology, P.R. China*); Lei Wan (*Ericsson Research, P.R. China*)

8. Open-loop Transmit Diversity for Broadcast Channel Transmission in E-UTRA

Kapseok Chang, Il Gyu Kim, Young-Hoon Kim, and Seung Chan Bang (*Electronics and Telecommunications Research Institute, Korea*)

9. A Practical Timing Recovery Method for OFDM Systems

Yeonsu Kang, Kunseok Kang and Doseob Ahn (*Electronics Telecommunications Research Institute, Republic of Korea*)

10 Impact of Nonlinear Power Amplifier on Link Adaptation Algorithm of OFDM Systems

Suvra Sekhar Das, Faisal Tariq, Muhammad Imadur Rahman, Flemming Bjerger Frederiksen, Elisabeth De Carvalho, Ramjee Prasad (*Aalborg University, Denmark*)

11 Blind Channel Estimation for Zero-Padded OFDM Systems Based on Correlation Matching

Fabian D. Backx, Tiago T.V. Vinhoza and Raimundo Sampaio-Neto (*CETUC - PUC - Rio, Brazil*)

12 Out-of-band Distortion Reduction in DVB-T Systems with Particle Swarm Digital Predistorters

Pedro Luis Carro, Paloma García Dúcar, Jesús de Mingo, Antonio Valdovinos (*University of Zaragoza, Spain*)

13 Development and Experiments of 100MHz Bandwidth Testbed for IMT-Advanced Systems

Noriaki Miyazaki, Toshihiko Komine, Yasuyuki Hatakwana and Toshinori Suzuki (*KDDI R&D Laboratories, Japan*)

14 Robust MIMO-OFDM E-SDM Systems with Low Complexity in Time-Varying Indoor Fading Environments

Bui Huu Phu, Toshihiko Nishimura, Hiroshi Nishimoto, Takeo Ohgane, and Yasutaka Ogawa (*Hokkaido University, Japan*)

Tuesday 2 October 13.30 – 15.00 Baltimore A

6A: Resource Management

Chair: Benedito Fonseca

1. Advanced Disjoint Address Allocation for Mobile Ad Hoc Networks

Jinkyu Lee, Sehoon Kim, Ikjun Yeom (*Korea Advanced Institute of Science and Technology, South Korea*)

2. Distributed and Centralized Mobility-Aware Caching Schemes for Collaborative Service Provision in User-Deployed Networks

Pietro Lungaro (*The Royal Institute of Technology, Sweden*)

3. Impact of HSDPA Radio Resource Allocation Schemes on the System Performance of UMTS Networks

Andreas Mäder, Dirk Staehle and Markus Spahn (*University of Wuerzburg, Germany*)

4. Assessment of Access Selection and Transmit Diversity in (Non) Cosited Multi-Access Networks

Remco Litjens (*TNO Information and Communication Technology, The Netherlands*); Fredrik Berggren (*Huawei Technologies, Sweden*)

5. Active Queue Management for Reducing Downlink Delays in WiMAX

Jani Lakkakorpi (*Nokia Technology Platforms, Finland*); Alexander Sayenko, Juha Karhula, Olli Alanen (*University of Jyväskylä, Finland*); Jani Moilanen (*Nokia Research Center, Finland*)

Tuesday 2 October 13.30 – 15.00 Fells Point

6B: MIMO: Channels + Estimation

Chair: Masoud Salehi

1. Impact of Array Configuration on Channel- and Noise-Covariance in Multiple Antenna Systems

Wilhelm Keusgen (*Heinrich-Hertz-Institut, Germany*)

2. Channel Estimation with Space-Time Windowing in MIMO PE-SDM Transmission

Hiroshi Nishimoto, Toshihiko Nishimura, Takeo Ohgane, and Yasutaka Ogawa (*Hokkaido University, Japan*)

3. Efficient Preamble Structures for MIMO OFDM-based WLAN Systems

Jihyung Kim (*ETRI, Korea*); Sangho Nam, (*Yonsei University (CITY), Korea*); Dong Seung Kwon (*ETRI, Korea*); Daesik Hong (*Yonsei University (CITY), Korea*)

4. A Unitary MUSIC-Like Algorithm for Coherent Sources

Nizar Tayem and Mort Naraghi-Pour (*Louisiana State University, USA*)

5. Data Aided Symbol Timing Estimation in Space-Time Coded CPM Systems over Rayleigh Fading Channels

Wenli Shen, Minjian Zhao, Peiliang Qiu and Aiping Huang (*Zhejiang University, Hangzhou, China*)

Tuesday 2 October 13.30 – 15.00 Federal Hill

6C: Fading Channels

Chair: David Matolak

1. Asymptotic BEP and SEP of MRC in Correlated Ricean Fading and Non-Gaussian Noise

Ali Nezampour, Amir Nasri, Robert Schober (*University of British Columbia, Canada*); Yao Ma (*Iowa State University, USA*)

2. Assessing and Modelling the Effect of RF Impairments on UTRA LTE Uplink Performance

Basuki E. Priyanto, Troels B. Sørensen, Ole K. Jensen, Torben Larsen (*Aalborg University, Denmark*); Troels Kolding (*Nokia Siemens Networks, Denmark*); Preben Mogensen (*Aalborg University and Nokia Siemens Networks, Denmark*)

3. On the Capacity of MIMO-OFDM Systems with Doubly Correlated Channels

Guoliang Shen, Shouyin Liu (*Huazhong Normal University, China*); Seong-hyun Jang, Jong-Wha Chong (*Hanyang University, Korea*)

4. Prior NLOS Ratio Estimate and Measurements Rating in Wireless Cellular Networks

Santiago Mazuelas, Francisco A. Lago, Juan Blas , Patricia Fernandez , Ruben M. Lorenzo, Evaristo J. Abril (*University of Valladolid, Spain*)

5. Improved Estimation of the Ricean K Factor from I/Q Samples

Kareem Baddour, Tricia Willink (*Communications Research Centre, Canada*)

Tuesday 2 October 10.30 – 12.00 Homeland

6D: Cellular and Heterogeneous Networks I

Chair: Fredrik Persson

1. Site Specific Knowledge for Improving Frequency Allocations in Wireless LAN and Cellular Networks

Jeremy K. Chen (*Qualcomm Flarion Technologies, Inc., USA*); Theodore S. Rappaport, Gustavo de Veciana (*The University of Texas at Austin, USA*)

2. Voice over IP Realized for the 3GPP Long Term Evolution

Fredrik Persson (*Ericsson Research, Sweden*)

3. MAC Scheduling Scheme for VoIP Traffic Service in 3G LTE

Sunggu Choi (*ETRI, Korea*); Kyungkoo Jun, (*University of Incheon, Korea*); Yeonseung Shin (*ETRI, Korea*); Seokhoon Kang, Byoungjo Choi (*University of Incheon, Korea*)

4. Spectral Efficient Frequency Allocation Scheme in Multihop Cellular Network

Lei Guan, Jianhua Zhang, Jianing Li, Guangyi Liu, Ping Zhang (*Beijing University of Posts and Telecommunications, China*)

5. HAD: a Novel Function for TCP Seamless Mobility in Heterogeneous Access Networks

Khadija Daoud, Bessem Sayadi (*France Telecom R&D, France*)

Tuesday 2 October 13.30 – 15.00 Guilford

6E: Propagation Theory

Chair: Volker Jungnickel

1. Ocelot's Knapsack Calculations for Modeling Power Amplifier and Walsh Code Limits

Kenneth L. Clarkson, (*IBM Research, USA*); John D. Hobby (*Bell Laboratories, Alcatel-Lucent, USA*)

2. Asymptotic Performance of Digital Communication over Fading Channels

Ning Kong and Laurence B. Milstein (*UCSD, USA*)

3. Closed-Form Expression for the Bit Error Probability of Rectangular QAM Subject to Rayleigh Fading

Waslon Terlizzie A. Lopes (*College of Science and Technology - Salvador, Brazil*); Francisco Madeiro (*University of Pernambuco, Brazil*); Marcelo S. Alencar (*Federal University of Campina Grande, Brazil*)

4. On the Problems of Symbol-Spaced Tapped-Delay-Line Models for WSSUS Channels

Carlos A. Gutiérrez-Díaz-de-León, Margarita Cabrera-Bean (*Polytechnic University of Catalonia, Spain*); Matthias Pätzold (*Agder University College, Norway*)

5. Analytical Envelope Correlation and Outage Probability of Maximal-Ratio Combined Ricean Fading Channels

Zhuwei Wang, Yanfen Hu, Xubin Chen, Xin Zhang Dacheng Yang, (*Beijing University of Posts and Telecommunications, P.R. China*)

Tuesday 2 October 13.30 – 15.00 Kent

6F: Wireless Applications

Chair: Tomohiko Taniguchi

1. A Combined Biologically and Socially Inspired Approach to Mitigating Ad Hoc Network Threats

Jimmy McGibney, Dmitri Botvich, Sasitharan Balasubramaniam (*Waterford Institute of Technology, Ireland*)

2. Influence of Codecs on Adaptive Jitter Buffer Algorithm

Radhika M. Hirannaiah, Amarnath Jasti and Ravi Pendse, (*Wichita State University, USA*)

- 3. Distributed Computing Through Web Browser**
Fabio Boldrin, Chiara Taddia, Gianluca Mazzini (*University of Ferrara, Italy*)
- 4. Luby Transform Coding Aided Bit-Interleaved Coded Modulation for the Wireless Internet**
R.Y.S. Tee, T.D. Nguyen, S.X. Ng, L-L. Yang and L. Hanzo (*University of Southampton, UK*)
- 5. On the Secrecy Capabilities of ITU Channels**
Chunxuan Ye, Alex Reznik, Gregory Sternberg, Yogendra Shah (*InterDigital Communications Corporation, USA*)

Tuesday 2 October 13.30 – 15.00 Baltimore B

6G: Wireless Device Architectures I

Chair: Nils Holte

- 1. Experimental Evaluation of Man-Made Noise for Cryogenic Receiver Front-End**
Shoichi Narahashi, Kei Satoh, Yasunori Suzuki, Tetsuya Mimura, (*NTT DoCoMo, Inc., Tokyo, Japan*); Toshio Nojima (*Hokkaido University, Japan*)
- 2. Antenna Advancement Techniques and Integration of RFID Electronics on Organic Substrates for UHF RFID Applications in Automotive Sensing and Vehicle Security**
Li Yang, Amin Rida, Jiexin Li, Manos M. Tentzeris (*Georgia Institute of Technology, USA*)
- 3. Multifunction Aperture for Vehicular Radar Integration**
Joseph S. Colburn, H.P. Hsu (*HRL Laboratories, USA*); Osman D. Altan (*General Motors R&D Center, USA*)
- 4. Ultrawideband Parallel Strip Antennas Designed by Genetic Algorithms**
Pedro Luis Carro, Jesús de Mingo (*University of Zaragoza, Spain*)
- 5. Novel On-Chip Antenna Structures and Frequency Selective Surface (FSS) Approaches for Millimeter Wave Devices**
Lawrence Ragan, Arjang Hassibi, Theodore S. Rappaport, Craig L. Christianson (*The University of Texas at Austin, USA*)

Tuesday 2 October 13.30 – 15.00 Foyer

6P: OFDM(A) Systems

Chair: Nak-Myeong Kim

- 1. Resource Allocation in Multiuser OFDM Distributed Antenna Systems**
Wenjun Xu, Kai Niu, Zhiqiang He, Weiling Wu (*Beijing University of Posts & Telecommunications, China*)
- 2. A QoS-Guarantee Resource Allocation Scheme in Multi-user MIMO-OFDM Systems**
Hui Tian, Shuang Wang, Youjun Gao, Qiaoyun Sun, Ping Zhang (*Beijing University of Posts & Telecommunications, China*)

Tuesday 2 October 15.30 – 17.00 Baltimore A

7A: Energy-Efficient Wireless Networks

Chair: Andreas Festag

- 1. Analysis and Optimization of Energy Efficient Cluster Forming for Wireless Sensor Networks**
Cheng Guo, Ramin Hekmat and Przemyslaw Pawelczak (*Delft University of Technology, The Netherlands*)
- 2. LIMOC: Enhancing the Lifetime of a Sensor Network with MOBILE Clusterheads**
Torsha Banerjee, Bin Xie, Jung Hyun Jun, Dharma P. Agrawal (*University of Cincinnati, USA*)

3. Hybrid Strategies for Link Adaptation Exploiting Several Degrees of Freedom in OFDM based Broadband Wireless Systems

Suvra Sekhar Das (*Aalborg University, Denmark and Tata Consultancy Services, India*); Muhhamad Imadur Rahman, Yuanye Wang, Flemming B. Frederiksen, Ramjee Prasad (*Aalborg University, Denmark*)

4. VoIP Capacity Model for an OFDMA Downlink

Patrick Hosein (*Huawei Technologies Co., Ltd.*)

5. A New Scheme with Controllable Capacity and Fairness for OFDMA Downlink Resource Allocation

Bin Da, C.C. Ko (*National University of Singapore, Singapore*)

6. Optimal Resource Allocation Strategy with Extended Region and Time Partitioning for HDD OFDM Systems

Hye-In Yu, Su-Jung Shin, Mee-Ran Kim and Nak-Myeong Kim (*Ewha Womans University, Korea*)

7. An Adaptive Random Access Protocol for OFDMA System

Lei Sun, Youjun Gao, Hui Tian, Haibo Xu, Ping Zhang (*Beijing University of Posts and Telecom., P.R. China*)

8. Switched Opportunistic Packet Scheduling for High Speed Packet Access MIMO Systems

Noureddine Hamdi, Med Aymen Ben Cheikha (*Institut National des Sciences Appliquées et de Technologie, Tunisia*)

9. Reverse Link Power Control for Managing Inter-cell Interference in Orthogonal Multiple Access Systems

Anil M. Rao (*Alcatel-Lucent, NJ*)

10A Simplified Layered QoS Scheduling Scheme in OFDM Networks

Liu Zhe, Zhiqiang He, Weiling Wu (*Beijing University of Posts and Telecommunications, China*); Xinglin Wang (*Siemens Ltd. China, Beijing, China*)

11 Radio Resource Allocation and Packet Scheduling Strategies for Single-Cell OFDMA Packet Networks

Antonios Gotsis, Nektarios Koutsokeras, Philip Constantinou (*National Technical University of Athens, Greece*)

12 Effects of Non-Ideal Channel Feedback on Dual-Stream MIMO-OFDMA System Performance

István Z. Kovács, Klaus I. Pedersen, Troels E. Kolding (*Nokia Siemens Networks, Denmark*); Akhilesh Pokhariyal (*Aalborg University, Denmark*); Markku Kuusela (*Nokia Research Center, Finland*)

13 Interference Analysis and Subchannel Allocation Schemes in Tri-sector OFDMA Systems

Keunyoung Kim, Geon-Min Yeo, Byung-Han Ryu and Kapseok Chang (*ETRI, Korea*)

3. An Energy-Efficient and Receiver-Driven MAC Protocol for Wireless Sensor Networks

Wee Lum Tan, Wing Cheong Lau, OnChing Yue (*The Chinese University of Hong Kong, China*)

4. A Price-Based Distributed Algorithm for Optimal Utility-Energy Trade-off in Wireless Sensor Networks

Wenqing Cheng, Shengbin Liao, Wei Liu, Zongkai Yang, Kanru Xu (*Huazhong University of Science and Technology, China*)

5. Improving Energy Consumption in Ad Hoc Networks Through Prioritization

Olfa Bouattay (*Ecole Supérieure des Communications de Tunis, Tunisie, and GET/Institut National des Télécommunications, France*); Tijani Chahed (*GET/Institut National des Télécommunications, France*); Mounir Frikha, Sami Tabbane (*Ecole Supérieure des Communications de Tunis, Tunisie*)

Tuesday 2 October 15.30 – 17.00 Fells Point

7B: MIMO OFDM

Chair: David Falconer

- 1. Finite Impulse Response Cyclic Shift Transmit Diversity for Broadband Mobile OFDM**
William J. Hillery, Thomas P. Krauss, Bishwarup Mondal, Timothy A. Thomas, and Frederick W. Vook (*Motorola Labs, USA*)
- 2. Random Beamforming OFDMA for Future Generation Cellular Communication Systems**
Congzheng Han, Angela Doufexi, Simon Armour, Joe McGeehan (*University of Bristol, UK*); Yong Sun (*Toshiba Research Laboratory, UK*)
- 3. Design of Novel Orthogonal Space-Time-Frequency Block Codes for OFDM Systems over Fading Channel Environments**
Keonkook Lee (*Information and Communications University, Korea*); Hoojin Lee (*The University of Texas at Austin, USA*); Namseok Chang, Joonhyuk Kang (*Information and Communications University, Korea*)
- 4. Generalized Cyclic Delay Diversity for Orthogonal Frequency Division Multiplexing**
Harry Z.B. Chen, Robert Schober, Lutz Lampe (*University of British Columbia, Canada*)
- 5. Mitigation of MIMO Co-Channel Interference using Robust Interference Cancellation Receiver**
Muhammad Imadur Rahman, Elisabeth de Carvalho, Ramjee Prasad (*Aalborg University, Denmark*)

Tuesday 2 October 15.30 – 17.00 Federal Hill

7C: Channel estimation for OFDM

Chair: Phillip Regalia

- 1. On the Use of Implicit Pilots for Channel Estimation with OFDM Modulations**
Rui Dinis (*Technical University of Lisbon, Portugal*); Nuno Souto, João Silva (*IT Lisboa - Instituto Superior Técnico, Portugal*); Atul Kumar (*Technical University of Lisbon, Portugal*); Américo Correia (*IT Lisboa - Instituto Superior Técnico, Portugal*)
- 2. Direct Time-domain Channel Impulse Response Estimation for OFDM-based Systems**
Carlos Ribeiro (*Polytechnic Institute of Leiria, Portugal*); Atilio Gameiro (*University of Aveiro, Portugal*)
- 3. Iterative Phase Noise Mitigation in MIMO-OFDM Systems with Pilot Aided Channel Estimation**
Steffen Bittner, Ernesto Zimmermann and Gerhard Fettweis (*Technische Universität Dresden, Germany*)
- 4. Channel Estimation based on Comb-Type Pilot Structure in OFDM System with Null Subcarriers**
Jihyung Kim and Dong Seung Kwon (*Electronics and Telecommunications Research Institute (ETRI), Korea*); Sangho Nam and Daesik Hong (*Yonsei University, Korea*)
- 5. Effects of Channel Estimation Error on the BER Performance of OFDM Systems in Multipath Rayleigh Fading Channels**
Chi-Hsiao Yih (*Tamkang University, Taiwan*)

Tuesday 2 October 15.30 – 17.00 Homeland

7D: QoS and Power Control

Chair: Dong-Ho Cho

- 1. Resource Allocation Scheme for Minimizing Power Consumption in OFDMA Cellular Systems**
JuYeop Kim, and Dong-Ho Cho, (*Korea Advanced Institute of Science and Technology (KAIST), Korea*)

2. Efficient Bitmap Signaling for VoIP in OFDMA

Sean McBeath, Jack Smith (*Huawei Technologies, USA*); Doug Reed, Hao Bi (*Motorola Inc.*); Anthony Soong, Jianmin Lu, Denny Chen, (*Huawei Technologies, USA*); Danny Pinckley, Alfonso Rodriguez-Herrera, Jim O'Connor (*Motorola Inc., USA*)

3. Adaptive Radio Resource Allocation with Novel Priority Strategy Considering Resource Fairness in OFDM-relay System

Wang Ying, Wu Tong, Huang Jing, Shu Chao, Yu Xinmin, Zhang Ping (*Ministry of Education and Beijing University of Posts and Telecommunications, China*)

4. QoS Aware Packet Scheduling Algorithm for OFDMA Systems

Haipeng Lei, Chen Fan, Xin Zhang, Dacheng Yang (*Beijing University of Posts and Telecommunications, P.R. China*)

5. Opportunistic Feedback Protocol for Minimizing Power in Uplink with Heterogeneous Traffic

Rajiv Agarwal, Vineet Abhishek, Rath Vannithamby and John Cioffi (*Stanford University, USA*)

Tuesday 2 October 15.30 – 17.00 Kent

7F: Service Management

Chair: Rajiv Agarwal

1. A Software Download Management Module

Oliver Holland, Toktam Mahmoodi, A. Hamid Aghvami (*King's College London, UK*)

2. Design and Implementation of A Lightweight Brokering System for Content/Service Charging in a Cellular Network Centric Business Model

Jenq-Shiou Leu (*National Taiwan University of Science and Technology, Taiwan*)

3. Research on Service Management Data Modeling Based on SID

Gang Chen, Baofei Yang, Wenan Zhou, Junde Song (*Beijing University of Posts and Telecommunications, P.R. China*)

4. SIP Embedded Attribute Certificates for Service Mobility in Heterogeneous Multi-Operator Wireless Networks

Oscar Salazar Gaitán, Philippe Martins (*ENST, France*); Samir Tohmé (*Université de Versailles, France*); Jacques Demerjian (*Altran Telecoms & Media, France*)

5. Provision of User-Centric Mobile Services in Next Generation Mobile Communication Environment

JungSook Bae, SookYang Kang, JaeHo Kim, Brad HyunSeo Park, KyungSook Kim, GyungChul Sihn (*Mobile Telecommunications Research Division, ETRI, Korea*)

Tuesday 2 October 15.30 – 17.00 Baltimore B

7G: Wireless Device Architectures II

Chair: Li Yang

1. On Hardware Implementation of Multiuser Multiplexing for SC-FDMA

Andreas Ibing, Volker Jungnickel (*Heinrich-Hertz-Institut, Germany*)

2. Design of a Software Radio Prototype for the Analysis of Beamformers in Satellite Communications

Ramón Martínez Rodríguez-Osorio, Alberto Bravo Sánchez, Miguel A. Salas Natera (*Universidad Politécnica de Madrid, Spain*)

3. Platform Based Design of Terminals and Infrastructure Components for Cognitive Wireless Networks

Christoph Spiegel, Alex Vießmann, Admir Burnic, Arjang Hessamian-Alinejad, Andreas Waadt, Guido H. Bruck and Peter Jung (*Universität Duisburg-Essen, Germany*)

4. Iterative (TURBO) IQ Imbalance Estimation and Correction in BICM-ID for Flat Fading Channels

Raghunath Cherukuri, Poras T. Balsara (*University of Texas Dallas, USA*)

5. Digital Predistortion of Power Amplifiers Based on Spline Approximations of the Amplifier Characteristics

Nima Safari, Nils Holte, Terje Roste (*NTNU, Norway*)

Tuesday 2 October 15.30 – 17.00 Foyer

7P: Coding, Signal Processing, and System Capacity

Chair: Jinho Choi

1. Large Frequency Offset Estimation for Digitally Modulated Signals in Low SNR Environment

Liang Chang, Fuping Wang, Zanji Wang (*Tsinghua University, China*)

2. A Study on Segmented Data Rates for System Capacity

Yuli Yang, Meng Ma, Hongbing Cheng, Bingli Jiao, William C.Y. Lee (*Peking University, P.R. China*)

3. Throughput Analysis of TDMA System Forward Link Packet Data Transmission with Superposition Coding

Baojin Li, Zhifeng Ruan, Guoquan Lu, Xin Zhang, and Dacheng Yang (*Beijing University of Posts and Telecommunications, China*)

4. Word Error Probability Estimation by Means of a Modified Viterbi Decoder

Justus Ch. Fricke and Peter A. Hoeher (*University of Kiel, Germany*)

5. On the Performance of MC-CDMA Systems with TORC Detection and Channel Estimation Error

Barbara M. Masini (*University of Bologna, Italy*)

6. A Reliability-Based SNR Estimation Method in Turbo Detection Systems

Li Qiang, Shaoqian Li (*University of Electronic Science and Technology of China, P.R. China*)

7. Row-splitting Design of Low-Density Parity-Check Codes for Gbps Transmission

Jong-Ee Oh, Minh Cheong, Cheol-Hui Ryu (*Electronics and Telecommunication Research Institute, Korea*); Seokhyun Yoon (*Dankook University, Korea*); Sok-kyu Lee (*Electronics and Telecommunication Research Institute, Korea*)

8. Capacity Analysis of Delay-Sensitive Services with Multi-user Packet in Forward Link of TDMA System

Yan Zhang, Chunchang Tian, Zheng Jiang, Xin Zhang, Dacheng Yang (*Beijing University of Posts and Telecommunications, China*)

9. Area Coverage of a Multi-link MIMO System with Water Filling Power Allocation Strategy

Akiyo Yoshimoto and Takeshi Hattori (*Sophia University, Japan*)

10 Architecture and Design Methodology for Structured LDPC Decoder

Jean-Baptiste Doré, Pierre Pénard and Marie-Hélène Hamon (*France Telecom, France*)

11 Size Compatible (SC)-Array LDPC Codes

Daisuke Abematsu (*Tokyo University of Science, Japan*); Tomoaki Ohtsuki (*Keio University, Japan*); Sigit P.W. Jarot, Tsuyoshi Kashima (*Nokia, Japan*)

12 Linear MMSE Frequency Domain Equalization with Colored Noise

Baojin Li, Qixing Wang, Guoquan Lu, Yongyu Chang, Dacheng Yang (*Beijing University of Posts and Telecommunications, China*)

Wednesday 3 October 2007

Wednesday 3 October 8.30 – 10.00 Baltimore A

8A: Error Control and Multicast in Wireless Networks

Chair: TBA

1. Multicast in Terrestrial-HAP Systems: “User Number” vs. “User Distribution” Oriented RRM Policies

Giuseppe Araniti, Antonella Molinaro, and Antonio Iera (*University of Reggio Calabria, Italy*)

2. Evaluation of Datacasting in the Mobile Environment

Kent Chamberlin, Scott Valcourt, Andrew Kun and Benjamin McMahon (*University of New Hampshire, USA*)

3. Network Coding Approach for Intra-cluster Information Exchange in Sensor Networks

Zhiqiang Xiong, Wei Liu, Jiaqing Huang, Wenqing Cheng, Bo Cheng (*Huazhong University of Science and Technology, China*)

4. Optimal Zone (OZON) Protocol for Broadcast Control in Ad-Hoc Networks

Nagaraja Thanthy, Deependra Malla, Ravi Pendse (*Wichita State University*)

5. Group-wise Scrambling Diversity for Broadcast and Multicast Services in OFDM Cellular System

Koji Akita, Ren Sakata, Noritaka Deguchi (*Toshiba Corp, Japan*)

Wednesday 3 October 8.30 – 10.00 Fells Point

8B: MIMO Equalization

Chair: Bill Hillery

1. Adaptive Conjugate Gradient DFEs for Wideband MIMO Systems using Galerkin Projections

Vassilis Kekatos, Aris S. Lalos, Kostas Berberidis (*University of Patras, Greece*)

2. Performance of Single-Carrier Frequency-Domain Adaptive Antenna Array

Byeong-woo Kang, Kazuaki Takeda, and Fumiyuki Adachi (*Tohoku University, Japan*)

3. A Joint TOA/AOA Constrained Minimization Method for Locating Wireless Devices in Non-Line-of-Sight Environment

Saleh Al-Jazzar and Mounir Ghogho (*University of Leeds, UK*)

4. PIC assisted IBDFE based Iterative Spatial Channel Estimation with Intra and Inter-Cell Interference in SC-FDE System

Fayyaz Siddiqui, Florence Danilo-Lemoine and David Falconer (*Carleton University, Canada*)

5. Joint Time Domain Decoding and Equalization for Time Reversal-Space Time Block Coded Systems

Abdulla Firag, Lee M. Garth (*University of Canterbury, New Zealand*)

Wednesday 3 October 8.30 – 10.00 Federal Hill

8C: Cooperative Diversity

Chair: Murat Uysal

- 1. Optimum Power Allocation for Fading Relay Channels**
Muhammad Mehboob Fareed and Murat Uysal (*University of Waterloo, Canada*)
- 2. On the Power Allocation for Cooperative Amplify-and-Forward Transmission**
Lian Zhao, Zaiyi Liao (*Ryerson University*)
- 3. Decode-and-Forward Cooperative Networks with Relay Selection**
Zhihang Yi, Il-Min Kim (*Queen's University, Canada*)
- 4. Performance Analysis and Code Design of Distributed Space-time Trellis Codes for a Detection-And-Forward System**
Li Chu, Jinhong Yuan (*The University of New South Wales, Australia*); Yonghui Li (*University of Sydney, Australia*)
- 5. Cooperative Diversity System Achieving Full-Rate and Full-Diversity by Constellation Rotation**
Haelyong Kim, Namshik Kim, Jaehong Kim, and Hyuncheol Park (*Information and Communications University (ICU), Korea*)

Wednesday 3 October 8.30 – 10.00 Homeland

8D: Cross-Layer Design

Chair: Seok Won

- 1. Cross-Layer Resource Allocation for Multiuser OFDM Systems Based on Elitist Selection Genetic Algorithm**
Zhihua Tang, Youtuan Zhu, Guo Wei, Jinkang Zhu (*University of Science and Technology of China, P.R. China*)
- 2. A Cross-layer Fast Handover Scheme for Mobile WiMAX**
Ling Chen, Xuejun Cai, Rute Sofia (*Nokia Siemens Networks, P.R. China*); Zhen Huang (*Beijing University of Posts and Telecommunications, P.R. China*)
- 3. CLOE: Cross-Layer Design for Wireless Networks**
C. Hager and D.J. Shyy (*The MITRE Corporation, USA*)
- 4. VoIP Capacity Model for the 1xEV-DO Uplink**
Patrick Hosein (*Huawei Technologies Co., Ltd.*)
- 5. Cross-Layer Resource Allocation for Heterogeneous Traffics in Multiuser OFDM Based on A New QoS Fairness Criterion**
Hua Hou, Wuyang Zhou (*University of Science and Technology of China, P.R. China*); Shengli Zhou (*University of Connecticut, USA*); Jinkang Zhu (*University of Science and Technology of China, P.R. China*)

Wednesday 3 October 8.30 – 10.00 Guilford

8E: OFDM II

Chair: Jinho Choi

- 1. Optimal Training Signals and Detection for OFDM Under Colored Noise**
N.N. Tran and H.D. Tuan (*The University of New South Wales (UNSW), Australia*); Ha H. Nguyen (*University of Saskatchewan, Canada*)
- 2. A Dual-Window Technique for Reducing Frequency Offset Sensitivity of OFDM**
Meng Ma, Hongbing Cheng, Bingli Jiao, and William C.Y. Lee (*Peking University, P.R. China*)
- 3. Resulting Channel Characteristics from Time-Varying Cyclic Delay Diversity in OFDM**
Simon Plass, Armin Dammann (*German Aerospace Center (DLR), Germany*); Gerd Richter, Martin Bossert (*Ulm University, Germany*)

4. Throughput Enhancement for IEEE 802.11a Wireless LANs

Wonchae Kim and Donald C. Cox (*Stanford University, USA*)

5. Receiver-based Compensation of Transmitter-incurred Nonlinear Distortion in Multiple-antenna OFDM Systems

Tim C.W. Schenk (*Philips Research Laboratories, and Eindhoven University of Technology, The Netherlands*); Cedric Dehos, Dominique Morche (*CEA-LETI MINATEC, France*); Erik R. Fledderus (*Eindhoven University of Technology, The Netherlands*)

Wednesday 3 October 8.30 – 10.00 Kent

8F: Broadcast & Multicast

Chair: Gianluca Mazzini

- 1. A Cognitive Radio (CR)-based Mobile Interactive Digital Broadcasting Application adopting a Multi-Resolution Spectrum-Sensing (MRSS) Technique**
Y. Hur, (*Samsung RFIC Design Center at Georgia Tech., USA*); G. Park (*Seoul National Industry University, Korea*); C.-H. Lee, (*Samsung RFIC Design Center at Georgia Tech., USA*); H.S. Kim, (*Hanbat National University, Korea*); J. Laskar (*Georgia Institute of Technology, USA*)
- 2. Efficient Scheduling for Heterogeneous Traffic in Downlink**
Rajiv Agarwal, Vinay Majjigi, Rath Vannithamby and John Cioffi (*Stanford University, USA*)
- 3. Time-Stable Geocast in Intermittently Connected IEEE 802.11 MANETS**
Sven Hermann, Christopher Michl, Adam Wolisz (*Technische Universität Berlin, Germany*)
- 4. Throughput Based Switching Threshold for Multicast and Unicast in Cellular OFDM Networks**
Markus Konrad and Wolfgang Koch (*University of Erlangen-Nuremberg, Germany*); Jörg Huschke (*Ericsson GmbH, Germany*)
- 5. Evaluating the Performance of Raptor Codes for DVB-H by using the Gilbert-Elliott Channel**
Leif R. Wilhelmsson (*Ericsson Research, Sweden*)

Wednesday 3 October 8.30 – 10.00 Baltimore B

8G: Space Time Coding

Chair: Noah Jacobsen

- 1. A Simple Orthogonal Space-Time-Polarization Block Code**
Beata J Wysocki, Tadeusz Wysocki (*University of Wollongong, Australia*); Sarah Spence Adams (*Franklin W. Olin College of Engineering, USA*); Hamid Sharif (*University of Nebraska-Lincoln in the Peter Kiewit Institute, USA*)
- 2. Performance Evaluation of MIMO-STBC for Inter-Vehicle Communications in a Shadowing Environment Generated by a Large Vehicle**
Kenji Ito, Noriyoshi Suzuki (*Toyota Central R&D Labs., Inc., Japan*); Yoshio Karasawa (*The University of Electro-Communications, Japan*)
- 3. An Orthogonal Full Rate Full Diversity Space Time Block Code for Four Transmit Antenna Systems**
Ning Yang, Masoud Salehi (*Northeastern University, USA*)
- 4. A New Information Lossless STBC for 2 Transmit Antennas with Reduced-Complexity ML Decoding**
Payam Rabiei and Naofal Al-Dhahir (*University of Texas at Dallas, USA*)

Wednesday 3 October 8.30 – 10.00 Foyer

8P: Cellular and Heterogeneous Networks II

Chair: Eunkyung Kim

- 1. On the Performance of Multi-Radio ARQ and Packet Scheduling in Ambient Networks**
Georgios P. Koudouridis, Peter Karlsson (*TeliaSonera, Sweden*)
- 2. Development of Digital Train Radio System in Tokyo Metropolitan Area**
Makoto Atsuzawa, Hitoshi Ohmori (*East Japan Railway Company, Japan*)
- 3. A Service-Differentiated Access Algorithm for Future Cooperative Networks**
Yang Ning; Tian Hui; Zhang Ping (*Beijing University of Posts & Telecommunications, P.R. China*)
- 4. ICT Anti Collision Radar for Road Traffic**
J. Pawelec, K. Kosmowski (*Defence Communications Institute, Poland*); Z. Krawczyk (*Radom University of Technology - Institute of Transport Telematics, Poland*)
- 5. Cross-Layer Partner-Based Fast Handoff Mechanism for IEEE 802.11 Wireless Networks**
Yuh-Shyan Chen (*National Taipei University, Taiwan, ROC*); Wei-Han Hsiao and Kau-Lin Chiu (*National Chung Cheng University, Taiwan, ROC*)
- 6. The Spatial Reuse Slot Allocation with Reallocating Neighbor Links in the TDMA-Based Wireless Mesh Network**
Kentaro Saito, Masaya Nakayama (*The University of Tokyo, Japan*)
- 7. Outer-loop Power Control Optimization Analysis and a New Algorithm**
Bo Wei, Lin Ma and Mazin Al-Shalash (*Huawei Technologies, USA*)
- 8. A Combined Design to Provide QoS for Mobile Ad Hoc Networks**
Mingxia Xu, Minjian Zhao, Wenli Shen, Aiping Huang (*Zhejiang University, China*)
- 9. Inter Base Station Resource Sharing and Improving the Overall Efficiency of B3G Systems**
Mehdi Bennis (*University of Oulu, Finland*); Jorma Lilleberg (*Nokia Technology Platforms, Finland*)
- 10 Estimation of Uplink WCDMA Load in a Single RBS**
Torbjörn Wigren (*Ericsson AB, Sweden*); Per Hellqvist (*True Value Solutions AB, Sweden*)

11 Cross-Layer Design to Improve Wireless TCP Performance with Link-Layer Adaptation

Toktam Mahmoodi, Vasilis Friderikos, Oliver Holland, A. Hamid Aghvami (*King's College London, UK*)

12 Ping-Pong Avoidance Algorithm for Vertical Handover in Wireless Overlay Networks

Won-Ik Kim, (*Electronics and Telecommunications Research Institute (ETRI), Korea*); Bong-Ju Lee, (*Korea Meteorological Administration (KMA), Korea*); Jae-Su Song, Yeon-Seung Shin and Yeong-Jin Kim (*Electronics and Telecommunications Research Institute (ETRI), Korea*)

13 An Efficient Resource Allocation for TCP Services in IEEE 802.16 Wireless MANs

Eunkyung Kim, Juhee Kim, and Kyung Soo Kim (*Electronics and Telecommunications Research Institute (ETRI), Korea*)

14A Method for Non-real-time Polling Service in IEEE 802.16 Wireless Access Networks

Jing Wu, Jeonghoon Mo (*Information and Communications University (ICU), South Korea*); Ting Wang (*Beijing University of Posts and Telecommunications, China*)

15A Routing Protocol for Wireless Mesh Networks

Valeria Loscri (*University of Calabria, Italy*)

16 Extensions to Resource Reservation Protocol (RSVP) with Guard Channel for Mobile IPv6

Yi Sun, Yucheng Zhang, Yilin Song, Jinglin Shi (*Institute of Computing Technology, P.R. China*); Eryk Dutkiewicz (*University of Wollongong, Australia*)

17 QoS Differentiation Adaptive Retransmission Limits ARQ for IEEE 802.16e BWA System

Shu Chao, Ma Nan, Wu Tong, Wang Ying, Zhang Ping (*Key Laboratory of Universal Wireless Communication, and Beijing University of Posts and Telecommunications, China*)

18 Downlink Traffic Power Characterization for Multi-Rate Wireless CDMA Data Networks

Ashraf S. Hasan Mahmoud (*King Fahd University of Petroleum and Minerals, Saudi Arabia*)

19A Two-Step Vertical Handoff Algorithm in Heterogeneous Traffic and Systems

Jin-Yup Hwang, Jinyoung Oh, and Youngnam Han (*Information and Communications University, Korea*)

Wednesday 3 October 10.30 – 12.00 Baltimore A

9A: Heterogeneous Networks

Chair: Tuo Liu

- 1. Study on the Co-existence of 20ms TTI and 5ms TTI in E-DCH of TD-SCDMA HSUPA**
Mingke Li, Kai Wang, Jing Zhang, Yafeng Wang, Dacheng Yang (*Beijing University of Posts and Telecommunications, P.R. China*)
- 2. Analysis of WLAN to UMTS Handover**
Hyeyeon Kwon, Kyung-yul Cheon, Aesoon Park (*Electronics and Telecommunications Research Institute, Korea*)
- 3. On the Coexistence of Overlapping BSSs in WLANs**
Ariton E. Khafa, Anuj Batra (*Texas Instruments, Inc., USA*); Artur Zaks (*Texas Instruments, Inc., Israel*)
- 4. Design and Implementation of Protocols Related to Radio Network Layer over eNB in 3GPP LTE System**
Soon-Gi Park, Yeon-Seung Shin (*Electronics and Telecommunications Research Institute, Korea*); Dae-Young Kim (*Chungnam National University, Korea*)

5. On the Cooperation Between 3G and 2G Systems

L. Sartori, S-E. Elayoubi, F. Morlot and B. Fourestié (*Orange Labs, France*)

Wednesday 3 October 10.30 – 12.00 Fells Point

9B: MIMO Diversity/Outage

Chair: James Kim

1. Low-Complexity Transmit Beamforming for MIMO Systems

Seok-Hwan Park, Heunchul Lee, Sang-Rim Lee and Inkyu Lee (*Korea University, Korea*)

2. Outage Probability of MIMO Systems with Receive Antenna Selection in Spatially Correlated Rayleigh Fading Channels

Zhemini Xu, Sana Sfar and Rick S. Blum (*Lehigh University, USA*)

3. Downlink Steered Space-Time Spreading Assisted Generalised Multicarrier DS-CDMA Using Sphere-Packing-Aided Multilevel Coding

Mohammed El-Hajjar, Ronald Y.S. Tee, Hu Bin, Lie-Liang Yang and Lajos Hanzo (*University of Southampton, UK*)

4. Peak Power Characteristics of Single Carrier FDMA MIMO Precoding System

Hyung G. Myung (*Polytechnic University, USA*); Kyle Jung-Lin Pan, Robert Olesen, and Donald Grieco (*InterDigital Communications Corp., USA*)

5. Comparative Study of Open-loop Transmit Diversity Schemes for Four Transmit Antennas in Coded OFDM Systems

Chau Yuen, Yan Wu, and Sumei Sun (*Institute for Infocomm Research, Singapore*)

Wednesday 3 October 10.30 – 12.00 Federal Hill

9C: Equalization

Chair: Mohamed Moustafa

1. Turbo Equalization with Cancellation of Nonlinear Distortion Effects for CP-Assisted and Zero-Padded MC-CDMA Signals

Rui Dinis, Paulo Silva, Teresa Araújo (*Technical University of Lisbon, Portugal*)

2. Single-Carrier HARQ Using Joint THP and FDE

Kazuki Takeda, Hiromichi Tomeba and Fumiyouki Adachi (*Tohoku University, Japan*)

3. Decision-Feedback Detection for Free-Space Optical Communications

Michael L.B. Riediger, Robert Schober, Lutz Lampe (*University of British Columbia, Canada*)

4. BERT Chart Analysis of Adaptive and Non-adaptive Turbo Frequency Domain Equalization

Maryam Sabbaghian, David Falconer (*Carleton University, Canada*)

5. Rake Performance after Channel Shortening by Decay Factor Optimization in UWB Channels

Syed Imtiaz Husain, Jinhong Yuan (*University of New South Wales, Australia*); Jian Zhang, (*Australian National University, Australia*)

Wednesday 3 October 10.30 – 12.00 Homeland

9D: Cognitive Radio

Chair: Xiaoben He

1. Joint Power Control and Beamforming for Secondary Spectrum Sharing

Md Habibul Islam, Ying-Chang Liang and Anh Tuan Hoang (*Institute for Infocomm Research, Singapore*)

2. A Reconfigurable Mobile Terminal Software Architecture for QoS Signaling

Konstantinos Boukis, Hamid Aghvami (*King's College, UK*)

3. Multi-Satellite DVB-RCS System with RCST based on Software Defined Radio

F. De Rango, A.F. Santamaria, F. Veltri, M. Tropea, P. Fazio, S. Marano (*University of Calabria, Italy*)

4. Binary Time Series Approach to Spectrum Prediction for Cognitive Radio

Serhan Yarkan and Hüseyin Arslan (*University of South Florida, USA*)

5. Experimental Verification on the Prediction of the Trend in Radio Resource Availability in Cognitive Radio

Shoji Kaneko, Shinichi Nomoto, Tetsuro Ueda, Shingo Nomura, Kazunori Takeuchi, Keizo Sugiyama (*KDDI R&D Laboratories Inc., Japan*)

Wednesday 3 October 10.30 – 12.00 Guilford

9E: OFDM III

Chair: Alexander Wyglinski

1. Peak-to-Average Power Ratio Analysis for NC-OFDM Transmissions

Rakesh Rajbanshi, Alexander M. Wyglinski, Gary J. Minden (*The University of Kansas, USA*)

2. PAPR Reduction Method using Clipping and Peak-windowing in CI/OFDM System

Masaki Ojima, Takeshi Hattori (*Sophia University, Japan*)

3. Joint Channel Tracking and Symbol Detection for MIMO-OFDM Mobile Communications

Xiao-ying Zhang, Wei Shao, Ji-bo Wei (*National University of Defense Technology, China*)

4. Analysis of the Robustness of FMT Modulation in Time-Frequency Selective Fading Channels

Andrea M. Tonello and Francesco Pecile (*Università di Udine, Italy*)

5. OFDM with Cyclic-Pilot Time Diversity

Ali Yazdan-Panah, Behrang Nosrat-Makouei, Rodney G. Vaughan (*Simon Fraser University, Canada*)

Wednesday 3 October 10.30 – 12.00 Kent

9F: Location Applications

Chair: Chunxuan Ye

1. Doppler Location Based on Two-Dimension Searching in Orthogonal Complement Space in DAS

Wen Pan, Jiang Wu, Zhan-jun Jiang, Yan Wang, Xiao-hu You (*South-east University, P.R. China*)

2. NLOS Measurement Identification for Mobile Positioning in Wireless Cellular Systems

Wei-Kai Chao, Kuen-Tsair Lay (*National Taiwan University of Science and Technology, Taiwan, ROC*)

3. Speed Estimation Using Relative Radio Frequency Signature Matching

Mostafa Afgani and Harald Haas (*The University of Edinburgh, UK*)

4. Proposal of ID Composition for Fast Location Lookup in Overlay Nodes

Takayuki Warabino, Takashi Matsunaka, Keizo Sugiyama (*KDDI R&D LABORATORIES INC., Japan*)

5. Symmetric Double Side Two Way Ranging with Unequal Reply Time

Lee Jian Xing, Lin Zhiwei, and Francois Chin Po Shin (*Institute for Infocomm Research, Singapore*)

Wednesday 3 October 10.30 – 12.00 Baltimore B

9G: Feedback/Adaptive MIMO

Chair: Patrick Hosein

1. Efficient Transmit Strategy Using a Fraction of Feedback for QRD based V-BLAST Systems

Hoiyoon Jung, Jongsub Cha, Hyungsuk Jeon, and Hyuckjae Lee (*Information and Communications University, Korea*)

2. Adaptive Modulation and Coding for MIMO Systems with V-BLAST Detection

Guoquan Lu, Baojin Li, He Wang, Yang Song, Dacheng Yang (*Beijing University of Posts and Telecommunications, China*)

3. Power Allocation for MIMO Systems with Channel Mean or Covariance Information Feedback

Xiao Li, Shi Jin, and Xiqi Gao (*Southeast University, P.R. China*)

4. Random Beamforming Using Low Feedback and Low Latency Power Allocation

Toshinobu Kaneko, Yuki Tsuchiya (*Tokyo University of Science, Japan*); Tomoaki Ohtsuki (*Keio University, Japan*)

Wednesday 3 October 10.30 – 12.00 Foyer

9P: MAC and Power Control

Chair: Hans-Jürgen Zepernick

1. Centralized Multiple Random Access Protocol with Contention Window Adjustment

Shigeru Teruhi, Fusao Nuno and Kazuji Watanabe (*NTT Corporation, Japan*)

2. A Novel Transmission Control Algorithm for Framed-ALOHA Schemes in Dense RFID Networks

Carlo Mutti, Yinan Zhang, and Armin Wittneben (*Swiss Federal Institute of Technology (ETH) Zurich, Switzerland*)

3. Capacity Evaluation of Perceptual-Based Power Control in Mobile Radio Systems

Behrooz Rohani (*Western Australian Telecommunications Research Institute, Australia*); Hans-Jürgen Zepernick (*Blekinge Institute of Technology, Sweden*); Bijan Rohani (*Western Australian Telecommunications Research Institute, Australia*)

4. ITP&SUI - Based Channel Assignment in CAC Procedure for TDD-CDMA System

Chen Bo, Hong Liang, Chang Yongyu, Yang Dacheng (*Beijing University of Posts and Telecommunications, P.R. China*); Yang Guang (*France Telecom R&D Beijing, China*)

5. An Efficient ARQ Mechanism in Multi-hop Relay Systems based on IEEE 802.16 OFDMA

Soo-Yong Jeon (*Korea Advanced Institute of Science and Technology (KAIST), Korea*); Ki-Young Han, Kyungjoo Suh

(*Samsung Electronics Co., Ltd., Korea*); Dong-Ho Cho (*Korea Advanced Institute of Science and Technology (KAIST), Korea*)

6. Enhanced Micro-scheduling and Hardware Acceleration Architecture for High Data Rate WPAN MAC

Sangjae Lee, Youngae Jeon, Sangsung Choi (*Electronics and Telecommunications Research Institute, Korea*)

7. Performance Evaluation of Centralized Control Algorithm for Channel Allocation in Pico-cell System

Kenya Yonezawa, Kosuke Yamazaki, Takashi Inoue (*KDDI R&D Laboratories, Inc., Japan*)

8. A Packet Scheduling Algorithm Using Utility Function for Mixed Services in the Downlink of OFDMA Systems

Haipeng Lei, Lei Zhang, Xin Zhang, and Dacheng Yang, (*Beijing University of Posts and Telecommunications, P.R. China*)

9. On the Power Allocation for Decode-and-Forward Cooperative Transmission Over Rayleigh-Fading Channels

Lian Zhao and Zaiyi Liao (*Ryerson University, Canada*)

10 Multi-Channel Radio Resource Distribution Policies in Heterogeneous Traffic Scenarios

M.Carmen Lucas-Estañ, Javier Gozalvez, Joaquin Sanchez-Soriano, Manuel Pulido (*University Miguel Hernandez, Spain*); Daniel Calabuig (*Technical University of Valencia, Spain*)

11 Traffic Adaptive Uplink Scheduling Scheme for Relay Station in IEEE 802.16 Based Multi-hop System

Ohyun Jo, Dong-Ho Cho (*Korea Advanced Institute of Science and Technology (KAIST), Korea*)

12 Increasing VoIP Capacity on WiFi Networks Through the use of the FAIR Algorithm for MAC

Daniel E. Lucani, Renny E. Badra and Carlos M. Bianchi (*Universidad Simon Bolivar, Venezuela*)

Wednesday 3 October 13.30 – 15.00 Baltimore A

10A: Location and Mobility Management

Chair: Jani Lakkakorpi

1. A Bayesian Network and Rule-base Approach Towards Activity Inference

Venet Osmani, Sasitharan Balasubramaniam, Dmitri Botvich (*Waterford Institute of Technology, Ireland*)

2. A Mobility Management Technique with Simple Handover Prediction for 3G LTE Systems

Tae-Hyong Kim (*Kumoh National Institute of Technology, Japan*)

3. Localization Based on Feasible Geographic Region Approximation

Zhen Feng, Wei Liu, Kanru Xu and Wenqing Cheng (*Huazhong University of Science & Technology, China*)

4. Controlled Vs. Uncontrolled Mobility in Wireless Sensor Networks: Some Performance Insights

Stefano Basagni (*Northeastern University, USA*); Alessio Carosi and Chiara Petrioli (*Università di Roma, Italy*)

5. A Novel Location Model for 4G Mobile Communication Networks

Qimei Cui, Jun Liu, Xiaofeng Tao and Ping Zhang (*Key Laboratory of Universal Wireless Communications Lab., P.R. China,*)

Wednesday 3 October 13.30 – 15.00 Fells Point

10B: MIMO Detection

Chair: TBA

1. A Cholesky Based Detector for MIMO Flat Fading Channels

Junyoung Nam, Seong Rag Kim, and Hyun Kyu Chung (*Mobile Telecommunications Division Electronics and Telecommunications Research Institute, Korea*); Jinho Choi (*University of Wales Swansea, UK*)

2. A New MIMO System for Gbps Transmission

Yuro Lee, Minh Cheong (*Electronics and Telecommunication Research Institute, Korea*); Seokhyun Yoon (*Dankook University, Korea*); Sok-kyu Lee (*Electronics and Telecommunication Research Institute, Korea*)

3. An Improved LLR Computation for QRM-MLD in Coded MIMO Systems

Wonjae Shin, Hyounkuk Kim (*Information and Communications University (ICU), Korea*); Mi-hyun Son (*Samsung Advanced Institute of Technology (SAIT), Korea*); Hyuncheol Park (*Information and Communications University (ICU), Korea*)

4. A Proposal of RM QRM-MLD with Independent Adaptive Control of Surviving Symbol Replica Candidates for MIMO-OFDM System

Shinobu Nagayama and Takeshi Hattori (*Sophia University, Japan*)

5. An Efficient Oblique Projection Algorithm for V-BLAST Detection with Novel Ordering

Zizhe Ding, Xian-Da Zhang, Qiubin Gao and Yong-Tao Su (*Tsinghua University, China*)

Wednesday 3 October 13.30 – 15.00 Federal Hill
10C: CDMA and Spread Spectrum II

Chair: Jani Lakkakorpi

- 1. Signal Detection in an Impulsive Noise Environment using Locally Optimum Detection**
Arnab Roy, John F. Doherty (*The Pennsylvania State University*)
- 2. Performance of Relay-Assisted DS-CDMA Conflicting Multiuser/Inter-Relay Interference in Nakagami-m Fading Channels**
Wei Fang, Lie-Liang Yang, Lajos Hanzo (*University of Southampton, UK*)
- 3. Statistical PIC in Multirate DS-CDMA Systems over Dispersive Fading Channels**
Beibei Wang, David W. Matolak (*Ohio University, USA*)
- 4. Iterative SAGE-Based Receivers for Synchronous Coded DS-CDMA**
Bin Hu, Ingmar Land, Romain Piton and Bernard H. Fleury (*Aalborg University, Denmark*)
- 5. Joint Source Coding, Unity Rate Precoding and FFH-MFSK Modulation using Iteratively Decoded Irregular Variable Length Coding**
Sohail Ahmed, Robert G. Maunder, Lie-Liang Yang, Soon Xin Ng and Lajos Hanzo (*University of Southampton, UK*)

Wednesday 3 October 13.30 – 15.00 Homeland
10D: Modulation and Coding II

Chair: TBA

- 1. Bit and Power Loading Approach for Broadband Multi-Antenna OFDM System**
Muhammad Imadur Rahman, Suvra Sekhar Das, Yuanye Wang, Flemming Bjerger Frederiksen, Ramjee Prasad (*Aalborg University, Denmark*)
- 2. Performance of Symbol Combining with Constellation Change in Multihop Relay**
Junya Yamazaki, Tetsu Ikeda, Masahito Asa, Mohsin Mollah (*Motorola Japan Research Laboratory, Japan*)
- 3. Degree Distribution Based MIMO - LDPC Scheme**
Yiqing Cao, Xuehua Li, Zhengsong Li and Dacheng Yang (*Beijing University of Posts & Telecommunications, China*)
- 4. Grouping based Adaptive Resource Allocation for Multi-user MIMO-OFDMA with Precoding**
Jianjun Li (*Samsung Advanced Institute of Technology, Korea*); Hojin Kim (*ArrayComm, Korea*); Sungjin Kim (*Seoul National University, Korea*)
- 5. Near-Capacity Turbo Trellis Coded Modulation Design**
S.X. Ng, O. Alamri (*University of Southampton, United Kingdom*); Y. Li (*University of Sydney, Australia*); L. Hanzo (*University of Southampton, United Kingdom*)
- 6. Iterative Demodulation and Decoding for Rotated MPSK Constellations with Convolutional Coding and Signal Space Diversity**
Nauman F. Kiyani, Jos H. Weber (*Delft University of Technology, The Netherlands*)

Wednesday 3 October 13.30 – 15.00 Foyer
10P: Multiple Antenna Transmission and Reception

Chair: TBA

- 1. A Low Complexity Scheme for Adaptive MIMO OFDM System**
Yi Wang, Zhiheng Guo, Xiaofeng Tao, Ping Zhang, (*Beijing University of Posts and Telecom, China*)

2. An Asymptotic Waterfilling Solution for AWGN MIMO System Channels

Victor M. Vergara, Ramiro Jordan, (*University of New Mexico, USA*); Silvio E. Barbin (*University of New Mexico, USA, and Escola Politécnica da Universidade do São Paulo, Brazil*)

3. An Efficient CQI Feedback Scheme for Multiuser MIMO Systems

Myeon-gyun Cho (*Samsung Electronics, Korea*); Youngju Kim (*Yonsei University, Korea*); Youngsoo Kim (*Samsung Electronics, Korea*); Daesik Hong (*Yonsei University, Korea*)

4. Differential Super-Quasi-Orthogonal Space-Time Trellis Codes

Jun Wang, Jing Qian, Junhui Dou, Shouyin Liu (*Huazhong Normal University, China*); Seong-Hyun Jang, Jong-Wha Chong (*Hanyang University, Korea*)

5. Frequency Impact on the Indoor MIMO Channel Capacity Between 2 and 12 GHz

Alexis P. García A., Lorenzo Rubio (*Universidad Politécnica de Valencia -UPV, Spain*)

6. Joint Spatial Coding and Spatial Multiplexing: Optimal and Suboptimal Criteria

Lihua Li, Ping Zhang, Xiaoling Li (*Beijing University of Posts and Telecommunications, P.R. China*); Wenbing Yao (*Brunel University, UK*); Yonghua Song (*University of Liverpool, UK*)

7. Joint Transmit Antenna Selection with Rate Adaptation for Spatial Multiplexing Systems with Limited Feedback

Patricia Layec, Raphaël Visoz (*France Telecom Research and Development, France*); Antoine O. Berthet (*SUPELEC, France*)

8. Optimal Training Sequences for MIMO Channel Estimation with Spatial Correlation

Jiyong Pang, Jiandong Li, Linjing Zhao, Zhuo Lu (*Xidian University, China*)

9. Performance of MIMO-OFDM Systems with Adaptive Beamforming Algorithm

Nam Suk Lee, Yong Seouk Choi, Kyung Soo Kim (*Electronics and Telecommunication Institute, Korea*); Chan Kyu Kim (*Hanbat National University of Technology, Korea*)

10 Rate Upper Bound and Optimal Number of Weight Vectors for Opportunistic Beamforming

Meng Zeng, Jun Wang, Shaoqian Li (*University of Electronic Science and Technology of China, P.R. China*)

11 Reception and Measurement of MIMO-OFDM Signals with a Single Receiver

Mustafa E. Sahin, Hüseyin Arslan (*University of South Florida, USA*); Daljeet Singh (*Anritsu Company, USA*)

12 SDMA, Multiuser Diversity, and BF Using Array Antenna in OFDMA System

Choong Il Yeh and Dong Seung Kwon (*ETRI, Korea*)

13 Uplink SDMA Performance Comparison of Single and Multiple Antenna Mobiles

Young Seog Song and DongSeung Kwon (*ETRI, Korea*)

14 Iterative Group MAP Detection in MIMO Wireless Systems

Yuan Yang, Junfeng Hu, Hailin Zhang (*Xidian University, China*)

15 Low-Complexity Coordinated Interference-Aware Beamforming for MIMO Broadcast Channels

Jin He, Masoud Salehi (*Northeastern University, USA*)

16 On the Performance of a Receive Antenna Selection Method for MIMO-OFDM System

Quoc Tuan Tran (*Osaka City University, Japan*); Shinsuke Hara (*Osaka University, Japan*); Kriangsak Sivasondhivat, Jun-ichi Takada (*Tokyo Institute of Technology, Japan*); Atsushi Honda,

Yuuta Nakaya, Kaoru Yokoo, Ichirou Ida, Yasuyuki Oishi (*Mobile Phones Group, Fujitsu Limited, Japan*)

17 Sum-Rate Reduction due to Limited Feedback in MIMO Broadcast Channels with Block-Diagonalization
Amitav Mukherjee and Hyuck M. Kwon (*Wichita State University, USA*)

18 A Spatial Multiplexing MIMO Scheme with Beamforming for Downlink Transmission
Shu Fang, Lihua Li, Xiaofeng Tao, Ping Zhang (*Beijing University of Posts and Telecom., P.R. China*)

19 Packet-combining Demodulation Scheme for Cooperative MIMO-OFDM Transmission
Takeshi Onizawa, Yusuke Asai, Takeo Ichikawa and Hiroshi Kazama (*NTT Corporation, Japan*)

20 Transmit Antenna Selection for Hybrid Space-Time Block Code with Decision-Feedback Detector
Joohan Kim, Hyounkuk Kim, and Hyuncheol Park (*Information and Communications University (ICU), Korea*)

Tutorials

A range of tutorials will be held throughout the conference given by experts from industry and academia.

Sunday, September 30, 9.00 – 12.30 Federal Hill

T1: Vehicular Communications Networks

Maziar Nekovee, BT Research and Moh Lim Sim, Multimedia University

Vehicular communications networks (VCNs) are created by vehicles equipped with short and medium range wireless communication technology. They include vehicular ad-hoc networks (VANET), vehicle-to-vehicle and vehicle-to-infrastructure communications. VCNs enable a plethora of important applications and services, ranging from in-motion broadband wireless access, to Intelligent Transport Systems (ITS). Appropriately, there is a growing interest in these networks from governments, industry and the research community. Automobile manufacturers are currently prototyping vehicles equipped with Wi-Fi and governments have recently allocated spectrum for vehicular communications.

In this tutorial we explore the unique features and challenges that characterise these highly dynamic networks and explore their role in ITS and the provisioning of broadband wireless access to users on the road. We review state-of-the-art R&D in the development of system architectures, MAC protocols, routing and mobility management, modelling and performance analysis. We conclude by exploring future research directions. Where possible we will make use of demonstrations and case studies to illustrate the concepts and technologies presented.

This tutorial aims to provide participants with a combination of introductory and in-depth material, including demonstrations and case studies, which introduce the unique features and characteristics of high-speed wireless communications in vehicular setting. It explores key application areas and surveys the research challenges that they present across all communication layers. Subsequently, we aim to review state-of-the-art R&D (both our own and others) that attempts to address these challenges and explore open research questions and relevant emerging technologies, including dynamic spectrum access and cognitive radio.

Maziar Nekovee is a senior scientist at BT's Mobility Research Centre in Ipswich, UK. His research interests

include vehicular communications networks, theory and applications of complex networks and cognitive radio networks. Prior to joining BT he held research posts at Imperial College and Queen Mary College in London. He received his MSc. in Electrical Engineering (cum laude) from Delft University of Technology in the Netherlands and his PhD in theoretical and computational Physics from the University of Nijmegen, also in the Netherlands. Dr Nekovee is the author of over 50 papers in international journals and conferences. He is a guest co-editor of a special issue of ACM/Springer Journal on Mobile Networks and Applications (MONET) on Cognitive Radios, and a guest co-editor of a focus issue of the New Journal of Physics on complex networks. Dr Nekovee is the recipient of a Royal Society (UK's Academy of Science) Industry Fellowship, and an Honorary Senior Research Fellow at the University College London.

Moh Lim Sim is a senior lecturer in the Faculty of Engineering, Multimedia University, Malaysia He was with BT from Sept 2004 to Sept 2005 as Technical Group Leader. He has served as consultant to a number of companies and government agencies in Malaysia. Currently, he helps OCE Sdn Bhd to develop and design its own wireless mesh routers. His research interests include broadband wireless access, Wi-Fi mesh, and wireless sensor networks. Dr. Sim is the co-author of one book, one book-chapter, and more than 30 international journal/ conference articles.

Sunday, September 30, 9.00 – 12.30 Guilford

T2: MIMO-OFDM from the ground up; A case study (DVBT/H and Mobile Wi-Max 802.16e)

Ahmed M. Eltawil, University of California, Irvine and Raghu Mysore Rao, Xilinx Inc.

High data rate applications are driving the need for high throughput and spectrally efficient broadband communication systems. Efficient modulation schemes and multiple antenna techniques are being explored for such applications. MIMO-OFDM is one such promising technology. OFDM modulation has been adopted by almost all the major broadband wireless standards such as, 802.11a/g, DVB-T/DVB-H, 802.16, UWB, etc. MIMO-OFDM is also finding its way into some of the newer standards such as 802.11n, 802.16

and 802.16e. The key aspects of all of these standards are reliability, high-throughput and mobility. This tutorial will provide a comprehensive review of the concept and benefits of using MIMO-OFDM as a modulation of choice. The tutorial will further discuss DVB-H and 802.16e as two case-studies of advanced wireless standards.

In this tutorial we will start off by discussing the wireless propagation environment and study the characteristics of the wireless environment in the presence of scattering and mobility. We will introduce the audience to the key concepts of OFDM and MIMO-OFDM systems. We will explain why state of the art standards are converging on OFDM and MIMO as choice technologies. DVB-H will be used as a showcase of OFDM technology while 802.16 will be used to exemplify MIMO-OFDM technology. We will discuss the physical layer of these standards as well as their key performance metrics. In addition we will discuss some architectural aspects of implementing wireless systems on FPGAs. FPGAs are a popular platform for developing communication systems at the basestation, given their configurability and time to market advantage. Newer generation FPGAs also have dedicated fabric for efficient implementation of DSP and communication systems. Newer, higher level design methodologies, further improve this time to market advantage of FPGAs. We will briefly discuss these methodologies and also introduce some of the DSP and communication centric features of popular FPGAs.

Prof. Ahmed Eltawil is an assistant professor with the Electrical Engineering and Computer Science Dept. at the University of California, Irvine. He received his doctorate degree from the University of California, Los Angeles in 2003. From January 2001 till August 2003 he was director of ASIC Engineering at Innovics Wireless, a fabless semiconductor company, where he lead the development of the first reported diversity enabled third generation W-CDMA mobile station. Currently at UCI, his research interests are in advanced digital circuit and signal processing techniques for communication systems, including both circuit and system design. Dr Eltawil holds several awards in his field including the Henry Samueli faculty fellow of Engineering at the University of California.

Dr. Raghu Rao is a Senior Staff communications Systems Engineer in the Advanced Systems Technology Group at Xilinx Inc. He has a PhD in wireless communications from UCLA. Prior to joining Xilinx Raghu worked for Texas Instruments, Logic Modeling Corporation and was the Director of Engineering at Exemplar Logic. Most recently Raghu was the VP of engineering for a communications start-up developing MIMO-OFDM and DVB-H technologies. From 1999-2004 he was a fulltime PhD candidate researching algorithms for MIMO-OFDM wireless communication systems. From 1989-1992 he was at Texas Instruments (India) Pvt. Ltd. where he worked on placement and routing algorithms for ASICs and FPGAs. Between

1992 and 1994 he was involved in developing software for hardware modelers at Logic Modeling Corp. From 1994-1999 he was at Exemplar Logic Inc. where he worked on timing analysis and timing optimization algorithms for FPGA designs and later on was Director of Engineering where he was responsible for all of Exemplar Logic's engineering activities. His interests are in digital communication algorithms, signal processing and efficient DSP and communication algorithms for FPGAs.

Sunday, September 30, 9.30 - 17.30 Gibson

T3: The Four MIMOs, Their Multi-Functional Hybrids and Multi-User OFDM

Lajos Hanzo, University of Southampton

This light-hearted, but nonetheless research-oriented presentation is based on an amalgam of the Wiley/IEEE Press monographs~cite{8} - cite{video-2} and provides an overview of the four basic types of multiple antenna-aided wireless systems briefly characterised in Table~ref{tab:antennas}. We also argue that under realistic propagation conditions, when for example the signals associated with the MIMO elements become correlated owing to shadow fading, the predicted performance gains substantially erode. In this scenario only the combination of MIMOs with High-Speed Downlink Packet Access (HSDPA) style adaptive modulation and coding is capable of maintaining an adequate target performance. Other challenging reception scenarios are encountered in the so-called rank-deficient situations, when the number of receivers is lower than the number of transmitters, which requires powerful non-linear sphere decoders or Genetic Algorithm (GA) aided detectors. This overview will conclude with the portrayal of a variety of avantgarde hybrid MIMO designs to set out promising future research directions.

It is common place to refer to a range of diverse smart antenna constructions as MIMOs. However, there is a large variety of them, which may be broadly divided into four classes, which will be detailed in the course with the objective of providing detailed design examples for them: 1. In beam-forming the antenna elements are typically half-the-wavelength apart for the sake of creating a spatially selective transmitter/receiver beam. Smart antennas using beamforming have been employed for mitigating the effects of co-channel interfering signals and for providing beamforming gain. 2. Spatial Diversity (STBC & STTC) and Space-Time Spreading (STS) In contrast to the $\lambda/2$ -spaced phased array elements, in spatial diversity schemes, such as space-time block or trellis codes the multiple antennas are positioned as far apart as possible, so that the transmitted signals of the different antennas experience independent fading, resulting in the maximum achievable diversity gain. 3. Space Division Multiple Access (SDMA) exploits the unique, user-specific "spatial signature" of the individual users for differentiating amongst them. This allows the system to support multiple users within the same frequency

band and/or time slot. 4. Space Division Multiplexing (SDM) based MIMO systems also employ multiple antennas, but in contrast to SDMA arrangements, not for the sake of supporting multiple users. Instead, they aim for increasing the throughput of a wireless system in terms of the number of bits per symbol that can be transmitted by a given user in a given bandwidth at a given integrity.

Lajos Hanzo (FREng, FIEEE, FIET, DSc) (<http://www-mobile.ecs.soton.ac.uk>; www.ecs.soton.ac.uk/people/lh) has held various research and academic posts in Hungary, Germany and the UK. Since 1986 he has been with the School of ECS, University of Southampton, UK, where holds the Chair in Telecommunications. He co-authored 15 IEEE Press - John Wiley books totalling 10 000 pages on mobile radio communications, published in excess of 700 research papers, was TPC Chair of several IEEE conferences. He is the presenter of numerous keynote lectures and has been awarded a number of distinctions. He is an enthusiastic supporter of industrial-academic liaison and he offers a range of industrial courses. Lajos is also an IEEE Distinguished Lecturer of both the Communications as well as the Vehicular Technology Society and Governor of the IEEE VTS.

Sunday, September 30, 14.00 – 17.30 Federal Hill

T5: Advances in Multiuser MIMO Systems

Li-Chun Wang, National Chiao Tung University and Tomoaki Ohtsuki, Keio University

Multiple-input multiple-output (MIMO) antenna techniques have been the subject of great interest over the past decade and have been adopted in the emerging wireless systems. Recently, personalized broadcast becomes an interesting and important application for MIMO technologies, which aims to serve multiple users concurrently with personalized data for each individual user. Interestingly, the potential gains of MIMO antenna techniques in this point-to-multipoint environment can be even larger than for the point-to-point system. The goal of this tutorial is to provide attendees with an understanding of benefit and tradeoff of implementing MIMO personalized broadcast systems. The key enabling techniques for MIMO personalized broadcast systems, including dirty paper coding, scheduling, transmit beamforming, receive beamforming, and feedback mechanisms will be investigated from the system and network perspective in this tutorial

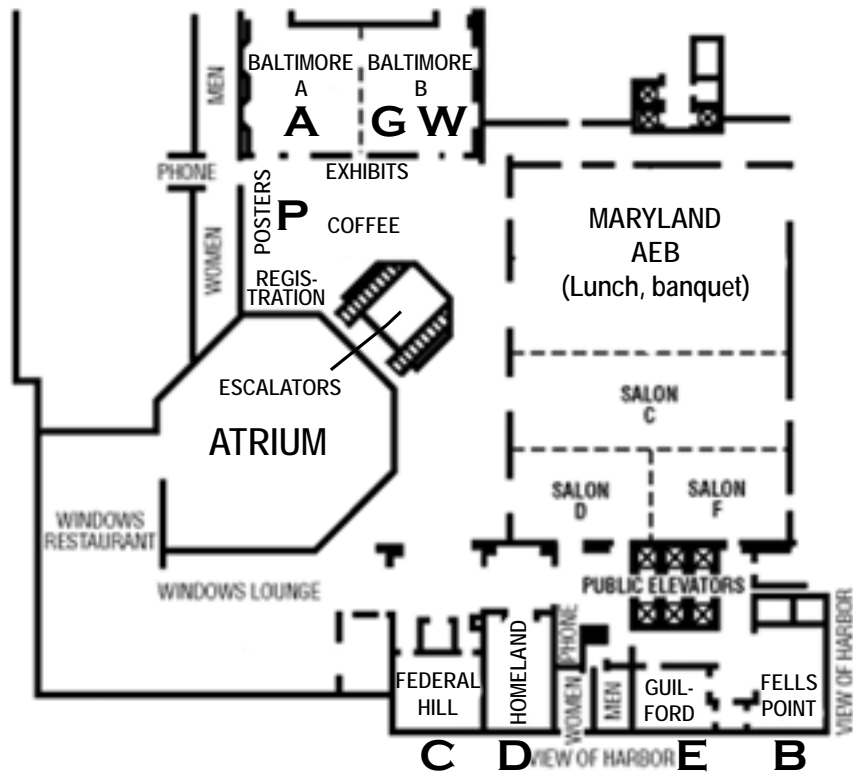
MIMO personalized multicast systems aims to serve multiple users concurrently with personalized data for each individual user. However, to exploit the potential gains of MIMO antenna techniques in this point-to-multipoint environment, many proposed enabling techniques are needed to be investigated from a system and network aspect. This is also the major goal of this tutorial. In this tutorial, we will discuss several key enabling techniques for MIMO personalized broadcast systems. We will investigate dirty paper coding, scheduling, transmit beamforming, receive

beamforming, and feedback mechanisms for MIMO personalized broadcast system from the system and network perspective. The participants are expected to learn the benefit and tradeoff of different enabling techniques to implement MIMO personalized broadcast systems, including dirty paper coding, scheduling, transmit beamforming, receive beamforming, feedback mechanisms, fairness, and power allocation issues. We also will highlight the future promising multiuser MIMO systems, such as multi-user MIMO-OFDM and peer-to-peer MIMO ad hoc networks.

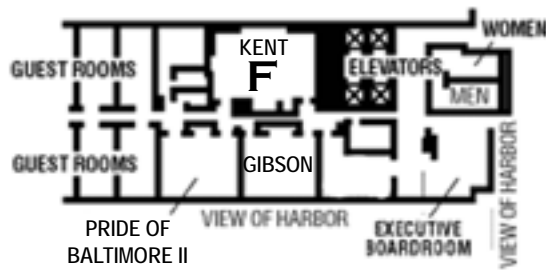
Dr. Li-Chun Wang received the B.S. degree from National Chiao Tung University, Taiwan, R. O. C. in 1986, the M.S. degree from National Taiwan University in 1988, and the Ms. Sci. and Ph. D. degrees from the Georgia Institute of Technology, Atlanta, in 1995, and 1996, respectively, all in electrical engineering. From 1990 to 1992, he was with the Telecommunications Laboratories of the Ministry of Transportations and Communications in Taiwan (currently the Telecom Labs of Chunghwa Telecom Co.). In 1995, he was affiliated with Bell Northern Research of Northern Telecom, Inc., Richardson, TX. From 1996 to 2000, he was with AT&T Laboratories, where he was a Senior Technical Staff Member in the Wireless Communications Research Department. Since August 2000, he has joined the Department of Communication Engineering of National Chiao Tung University in Taiwan as an Associate Professor and has been promoted to a full professor since August 2005. His current research interests are in the areas of cellular architectures, radio network resource management, cross-layer optimization, and cooperation wireless communications networks. Dr. Wang was a co-recipient (with Gordon L. Stuer and Chin-Tau Lea) of the 1997 IEEE Jack Neubauer Best Paper Award from the IEEE Vehicular Technology Society. He is an associate editor for the IEEE Transactions on Wireless Communications and holding three US patents.

Dr. Tomoaki Ohtsuki received the B.E., M.E., and Ph. D. degrees in Electrical Engineering from Keio University, Yokohama, Japan in 1990, 1992, and 1994, respectively. From 1994 to 1995 he was a Post Doctoral Fellow and a Visiting Researcher in Electrical Engineering at Keio University. From 1993 to 1995 he was a Special Researcher of Fellowships of the Japan Society for the Promotion of Science for Japanese Junior Scientists. From 1995 to 2005 he was with Tokyo University of Science. From 1998 to 1999 he was with the department of electrical engineering and computer sciences, University of California, Berkeley. He is now an Associate Professor at Keio University. He is engaged in research on wireless communications, optical communications, signal processing, and information theory. Dr. Ohtsuki is a recipient of the 1997 Inoue Research Award for Young Scientist, the 1997 Hiroshi Ando Memorial Young Engineering Award, Ericsson Young Scientist Award 2000, 2002 Funai Information and Science Award for Young Scientist, and IEEE the 1st Asia-Pacific Young Researcher Award 2001.

Conference Layout



Fifth Floor



Sixth Floor

