

ASHOK K. KARMOKAR

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PROFILE

- Excellent interpersonal and communication skills
- Very professional, cooperative, amiable and modest
- Very creative, versatile, vigorous and capable of working under pressure
- Highly motivated, focused and passionate about research, design, development and performance analysis
- Extremely quick-learner, self-starter and capable of working either in a team or individually
- Secured 1st position in the undergraduate class from the top ranked university in Bangladesh
- Recipient of competitive awards in all level of studies

QUALIFICATION HIGHLIGHTS

- More than 6 years of research, development and performance analysis experience in different Wireless Communications Research groups across Canada
- Excellent exposure of wireless communications technologies and network protocols due to extensive use of these technologies and protocols in research and performance analysis
- Excellent working skills in C/C++ and MATLAB languages on Linux, Mac and Windows platforms. Sound working experiences with MAPLE, MATHEMATICA, OPNET, SIMULINK, AMPL, OPL, PSPICE, VHDL programming and modeling languages
- Successfully developed several projects (using software programming and hardware implementation) as a part of undergraduate and graduate studies
- More than 3 years of hands-on experience with electrical, electronic, digital and RF devices, systems and computer testing tools (e.g., spectrum analyzers, oscilloscope, signal generators, microcontrollers, software debuggers)
- Strong foundation on electrical engineering (wireless, optical, digital and satellite communications systems and networks, channel coding, signal processing, data communications, very large scale integration (VLSI) and digital electronics, radio frequency systems, antenna, digital design and microprocessors, circuit analysis, etc), engineering mathematics, complex analysis, artificial intelligence and optimization techniques
- More than 4 years of experience in guiding undergraduate student projects and teaching assistant, and in teaching undergraduate courses

WORK EXPERIENCE

Research Fellow

Sep. 2008- present

Communication Systems and Networks Lab.
The University of Waterloo, Waterloo, ON, Canada

- Developing multiple wireless networks collaboration, cooperation and resource sharing techniques for co-existence, interference-mitigation and mutual capacity gain using proportional fair and max-min fair scheduling over wireless channels considering interference and noise.
- Modeled the systems considering interference and noise of wireless links and using large-scale fading
- Analyzed performance using MATLAB, C++, CPLEX and MINOS software tools.
- Achieved significant capacity gain using our technique than the traditional non-cooperative case.

Postdoctoral Fellow

Sep. 2007- Aug. 2008

Information Theory and Systems Lab.
The University of British Columbia, Vancouver, BC, Canada

- Developed cross-layer optimization techniques over MIMO wireless links (modeled using Nakagami- m fading) using OFDM and M-ary quadrature amplitude modulation (M-QAM) techniques for 3GPP LTE systems.
- Reduced transmission power requirement as compared to traditional single-layer adaptation

techniques by more than 35% using our technique

- Analyzed performance using MATLAB and C/C++ languages, and optimization tools
- Investigated user scheduling & adaptive packet transmission techniques for Cognitive radio networks
- Studied artificial intelligence based wireless sensor scheduling algorithms

Research Assistant

Sep. 2002- Aug. 2007

Communications Lab

The University of British Columbia, Vancouver, BC, Canada

- Developed adaptive optimal and sub-optimal (reduced complexity) packet transmission algorithms for wireless networks using dynamic programming and linear programming techniques
- Developed cross-layer adaptation technique over frequency-selective wireless links (modeled as Nakagami- m fading channel) using adaptive modulation and coding (AMC), rate-compatible punctured convolutional code (RCPC), Equalization and hybrid automatic repeat request (HARQ) techniques for 3GPP LTE systems
- Developed techniques can be applied to different point-to-point, mobile and fixed wireless networks, e.g., UMTS, IEEE 802.11, IEEE 802.16 (WiMAX), etc
- Performed extensive computer simulation using Markov decision process modeling and using C/C++, MATLAB, MAPLE and MATHEMATICA programming tools
- Achieved significant power and throughput gain for delay-tolerant traffic. Proposed techniques can also maintain delay, bit error rate (BER) and packet overflow requirements for specific application. Published research works in high quality IEEE journals and conferences

Lecturer

Jan. 2007- Apr. 2007

Dept. of Electrical and Computer Engineering

The University of British Columbia, Vancouver, BC, Canada

- Developed and taught undergrad course, conducted lab, and administered examination

Lecturer

Dec. 1998-Aug. 2002

Department of Electrical and Computer Engineering

Bangladesh University of Engineering and Technology

- Developed and taught sixteen electrical engineering lecture and laboratory courses for undergraduate students. Topics include Communication Systems, Microwave Engineering, Modern Control Systems, Electronics, Electrical Circuits, C++ programming language, Electrical Machineries, Electrical Power Systems, Measurements, and Instrumentation.
- Taught some courses more than once. Conducted labs, exams, marked answer scripts and prepared grades.

EDUCATION

▪ **Ph. D.- Electrical and Computer Engineering**

Aug. 2007

The University of British Columbia, Vancouver, BC, Canada

Thesis: Cross-layer Resource Scheduling for Wireless Systems over Correlated Fading Channels

Obtained GPA 4.00 on the scale of 4.00. Completed advanced courses on Convex Optimizations, Markov decision process, Statistical signal processing (detection and estimation), Wireless communications and networks, Computer communications networks, Queuing theory, Channel Coding, CDMA and OFDMA Systems, Digital communications, Machine learning, Hidden Markov model.

▪ **Master of Science- Electrical and Electronic Engineering**

May 2002

Bangladesh University of Engineering and Technology, Dhaka, Bangladesh

Thesis: Diffusion Capacitance of an Epitaxial High Barrier Schottky Diode

Completed advanced courses on Digital communications, Digital signal processing, Laser systems, Optical fiber communications and networks, Advanced engineering mathematics, Compound semiconductor devices, Integrated circuits and systems, Very large scale integration (VLSI). Modeled and analyzed performance of diffusion capacitance of a Schottky diode using C/C++ language.

- **Bachelor of Science-Electrical and Electronic Engineering (with distinction) Sep. 1998**
Bangladesh University of Engineering and Technology, Dhaka, Bangladesh
Thesis: Design and Fabrication of High Frequency Radio Transmitter

Secured 1st position in the class with honors grade point average (GPA). Completed 158 credit-hours course works on Communications systems, Analog and digital electronics, Digital integrated circuits and VLSI, Radio-frequency devices and systems, Modern control systems, Electric machineries and power electronics, Digital design and microprocessors, Circuit analysis, etc. Designed and implemented of 8-bit computer system, and different controllers using assembly languages in the undergraduate projects. Extensively used MATLAB and C/C++ programming languages.

AWARDS

- Natural Sciences & Engineering Research Council (NSERC) Industrial R&D Fellowship, 2007
- University Graduate Fellowship, University of British Columbia, Vancouver, BC, Sep. 2004-Aug. 2007
- Ph. D. Tuition Fee Award, University of British Columbia, Vancouver, BC, Sep. 2003-Aug. 2007
- Student Travel Grant Award from IEEE Communications Society, USA, 2004, 2005 (received in UBC)
- Graduate Student Travel Grant, University of British Columbia, Vancouver, BC, 2004, 2005, 2006
- Excellent Recruitment Award, University of Victoria, Victoria, BC, Sep. 2002-Aug. 2003
- Werner Von Siemens Excellence Award from Siemens AG, Germany, 2000 (received in Dhaka)
- Dean's List Award, Bangladesh University of Engineering and Technology, Dhaka, Sep. 1993-Sep. 1998
- Merit Scholarship, Bangladesh University of Engineering and Technology, Dhaka, Sep. 1993-Sep. 1998
- Altaf Hossain Fellowship, Bangladesh University of Engineering and Technology, Dhaka, 1996-1997
- Dr. Rashid Memorial Scholarship, Bangladesh University of Engineering and Technology, 1997-1998
- Dhaka Board Scholarship, Dhaka, Bangladesh, 1997-1998

PUBLICATIONS

Articles in Referred Journals:

- **Ashok K. Karmokar** and Vijay K. Bhargava, "Performance of cross-layer optimal adaptive transmission techniques over diversity Nakagami- m fading channels," in press, *IEEE Transactions on Communications*.
- **Ashok K. Karmokar**, Dejan V. Djonin, and Vijay K. Bhargava, "Cross-layer rate and power adaptation strategies for IR-HARQ systems over fading channels with memory: a SMDP-based approach," *IEEE Transactions on Communications*, vol. 56, no. 8, pp. 1352-1365, Aug. 2008.
- Dejan V. Djonin, **Ashok K. Karmokar**, and Vijay K. Bhargava, "Joint rate and power adaptation for type-I hybrid ARQ systems over correlated fading channels under different buffer cost constraints," *IEEE Transactions on Vehicular Technology*, vol. 57, pp. 421-435, Jan. 2008.
- **Ashok K. Karmokar**, Dejan V. Djonin, and Vijay K. Bhargava, "POMDP-based coding rate adaptation for type-I hybrid ARQ systems over fading channels with memory," *IEEE Transactions on Wireless Communications*, vol. 5, pp. 3512 – 3523, Dec. 2006.
- **Ashok K. Karmokar**, Dejan V. Djonin, and Vijay K. Bhargava, "Optimal and suboptimal packet scheduling over correlated time varying flat fading channels," *IEEE Transactions on Wireless Communications*, vol. 5, pp. 446-457, Feb. 2006.
- Daniela N. Djonin, **Ashok K. Karmokar**, Dejan V. Djonin, and Vijay K. Bhargava, "Adaptive rate transmission in ad hoc wireless networks," *IEICE Transactions on Communications*, vol. E87-B, pp. 1389-1392, May 2004.

Articles in Conference Proceedings:

- **Ashok K. Karmokar** and Vijay K. Bhargava, "Cross-layer design of optimal adaptation technique over selection-combining diversity Nakagami- m fading channels", in Proc. of *IEEE GLOBECOM 2008*, Nov. 30 -Dec. 4, 2008, New Orleans, LA, USA.
- **Ashok K. Karmokar** and Vijay K. Bhargava, "Adaptive coding and modulation for hybrid ARQ systems over partially observable Nakagami- m fading channels", in Proc. of *IEEE Global Telecommunications Conference (Globecom 2006)*, Nov. 27-Dec. 1, 2006, pp. 1-6.

- **Ashok K. Karmokar** and Vijay K. Bhargava, "Optimal packet scheduling using adaptive M-QAM and orthogonal STBC in MIMO Nakagami-m fading channels", in Proc. of *IEEE International Conference on Communications (ICC 2006)*, Jun. 11-15, 2006, pp. 5271-5276.
- **Ashok K. Karmokar**, Dejan V. Djonin, and Vijay K. Bhargava, "Delay-aware power adaptation for incremental redundancy hybrid ARQ over fading channels with memory", in Proc. of *IEEE ICC 2006*, Jun. 11-15, 2006, pp.4315-4320.
- K. Wavegedara, G. Bansal, P. Kaligineedi, M. Khabbazian, **A. Karmokar**, M. Rashid, H. Mercier, and V. Bhargava, "Wireless Communications: Trends and Challenges", in Proc. of *12th National Conference on Communications (NCC 2006)* (Invited paper), Delhi, India, Jan. 27-29, 2006.
- **Ashok K. Karmokar** and Vijay K. Bhargava, "Optimal packet scheduling over correlated Nakagami-m fading channels with different diversity-combining techniques", in Proc. of *IEEE Globecom 2005*, Nov. 28-Dec. 02, 2005, pp. 1217-1222.
- **Ashok K. Karmokar** and Vijay K. Bhargava, "Coding rate adaptation for hybrid ARQ systems over time varying fading channels with partially observable state," in Proc. of *IEEE ICC 2005*, May 16-20, 2005, pp. 2797-2801.
- Piplu R. Paul, **Ashok K. Karmokar**, and Vijay K. Bhargava, "Optimal power control for network-centric and user-centric wireless networks in interference-limited fading channels," in Proc. of *IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2005)*, May 1-4, 2005, pp. 51-54.
- **Ashok K. Karmokar**, Dejan V. Djonin, and Vijay K. Bhargava, "Delay constrained rate and power adaptation over correlated fading channels," in Proc. of *IEEE Globecom 2004*, Nov. 29- Dec. 03, 2004, pp. 3448-3453.
- Dejan V. Djonin, **Ashok K. Karmokar**, and Vijay K. Bhargava, "Optimal and suboptimal scheduling over time varying flat fading channels," in Proc. of *IEEE ICC 2004*, Jun. 20-24, 2004, pp. 906-910.
- M. M. Shahidul Hassan and **Ashok K. Karmokar**, "Diffusion capacitance of an epitaxial high barrier schottky diode," in Proc. of *IEEE International Conference on Electrical and Computer Engineering (ICECE 2002)*, Dec. 2002, pp. 124-127.

CONFERENCE PRESENTATIONS

- "Adaptive coding and modulation for hybrid ARQ systems over partially observable Nakagami- m fading channels" in *IEEE GLOBECOM2006*, Nov. 27-Dec. 1, 2006, San Francisco, CA, USA
- "Optimal packet scheduling over correlated Nakagami- m fading channels with different diversity-combining techniques" in *IEEE GLOBECOM 2005*, Nov. 28-Dec. 02, 2005, St. Louis, MO, USA
- "Coding rate adaptation for hybrid ARQ systems over time varying fading channels with partially observable state" in *IEEE ICC2005*, May 16-20, 2005, Seoul, South Korea
- "Optimal and suboptimal scheduling over time varying flat fading channels" in *IEEE ICC2004*, Jun. 20-24, 2004, Paris, France

EXTRACURRICULAR ACTIVITIES

- Organizer of IEEE VTC 2002 and IEEE CCECE 2007 Conference in Vancouver, BC
- Peer Reviewer of IEEE journals (Transactions on Communications, Transactions on Wireless Communications, Transactions on Vehicular Technology, etc) and conferences (ICC, GLOBECOM, WCNC, VTC, etc)
- Member of Institute of Electrical and Electronics Engineers (IEEE)

INTERESTS

- Reading, Traveling, Photography

CITIZENSHIP

- Canada

REFERENCES

- Available upon request