Barathram. Ramkumar

School of Computing and Electrical Engineering
Indian Institute of Technology Mandi
Near Bus Stand, Mandi - 175001
Himachal Pradesh, India
Phone: 91-8626888663, E-mail: barathram@iitmandi.ac.in; bramkum@vt.edu;

EDUCATION

Doctor of Philosophy – Electrical Engineering (GPA: 3.88) **Aug 2011**
Virginia Polytechnic Institute and State University, Blacksburg, VA

Dissertation Title: Automatic modulation classification and blind equalization for cognitive radios, Advisor: Dr. Tamal Bose

Master of Science – Measurement and Control Engineering (GPA: 4.0) **May 2007**
Idaho State University, Pocatello, ID

Thesis Title: Hybrid optimization technique applied to parameter estimation in the presence of colored noise*, Advisor: Dr. Marco P. Schoen*

BE – Electronics and Instrumentation Engineering (75%) **May 2005**
Anna University, Chennai, India

RESEARCH INTRESTS

Wireless communication, Adaptive signal processing, Signal detection and classification, Cognitive radios and Software defined radios.

RESEARCH AND TEACHING

Visiting Assistant Professor **Jan 2012 – Present**
School of Electrical and Computer Engineering

- Teaching the following courses: Digital signal processing (EE 305) and Theory of measurements (EE 307).
- Advising one PhD and one M.S student.

Research Assistant **Aug 2007 – Sep 2011**
Wireless @Virginia Tech, Blacksburg, VA

- Developed novel blind equalization and channel estimation algorithms for MIMO, SIMO and SISO communication systems.
- Developed novel multiuser detection and classification algorithms for communication signals.
- Involved in the design and development of Virginia Tech Cognitive Radio Test Bed (VT-CORNET)
- Developed a simple Dynamic Spectrum Access (DSA) protocol and demonstrated it using VT-CORNET

Mentor **May 2011 – Aug 2011**

NSF Research Experience for Undergraduates (REU) program, Virginia Tech

- Guided a group of three undergraduate students in conducting research in cognitive radios and software defined radios.
- Taught a one day short course on cognitive radio communication.

Teaching Assistant **Aug 2006 – May 2007**

College of Engineering, Idaho State University, ID

- Conduct lab sessions for analog and digital system design laboratory course, and introduction to electrical circuits.
- Lecture on topics in control systems and basic electric circuits.

Mathematics Tutor **Aug 2005 – May 2006**

Center for Teaching and Learning, Idaho State University, ID

- Handled help sections for undergraduate level basic mathematics courses.
- Tutored on math subjects which include calculus, trigonometry, and statistics.

PATENT FILED

B. Ramkumar and T. Bose, "Combined blind equalization and modulation classification", VTIP 09-077, application no 20110103454.

JOURNAL PUBLICATIONS

1. B. Ramkumar, and T. Bose, "Combined multiuser signal classification and blind equalization," submitted to **Springer Journal on Analog Integrated Circuits and Signal Processing**.

2. B. Ramkumar, T. Bose, and M. S. Radenkovic, "Robust automatic modulation classification and blind equalization: novel cognitive receivers," **Springer Journal on Analog Integrated Circuits and Signal Processing**, Nov. 2011.

3. B. Ramkumar, M. P. Schoen, and F. Lin, "Hybrid enhanced continuous tabu search and genetic algorithm for parameter estimation in colored noise environments," **Elsevier Journal on Expert Systems and Application**. Vol. 38, pp. 3909-3917, 2011.

4. M. S. Radenkovic, T. Bose, and B. Ramkumar, "Blind adaptive equalization of MIMO systems: New recursive algorithms and convergence analysis," **IEEE Trans. Circuits and Systems, Part-I**, vol. 57, no. 7, July 2010.

5. F. Lin, M. P. Schoen, R. Sekhri, and B. Ramkumar, "Modeling acoustic interaction of synthetic jet actuators," **Journal of Vibration and Control.** April 2010.

6. B. Ramkumar, and T. Bose, "Cyclostationarity based Automatic Modulation Classification for Cognitive Radios," **IEEE Circuits and Systems Magazine**, Vol. 9, Issue 2, June 2009.

CONFERENCE PUBLICATIONS

1. M.M.Sohul, B.Ramkumar, and T.Bose, "Combined multiuser signal classification and blind equalization," Accepted in **Proc. IEEE CROWMCOM**, 2012.

2. B. Ramkumar, T. Bose, and M. S. Radenkovic, "Combined multiuser signal classification and blind equalization," in **Proc. SDR Wireless Innovation Conference**, 2011. **(Best of R&D Track)**

3. B. Ramkumar and T. Bose, "Combined blind equalization and classification of multiple signals," **Proc. 1st International Conference on Pervasive and Embedded Computing and Communication Systems**, pp. 339-344, Mar. 2011

4. B. Ramkumar, T. Bose, M. S Radenkovic, and R. Thamvichai, "Robust automatic modulation classification and blind equalization: A novel cognitive approach," **Proc. SDR Wireless Innovation Conference**, pp. 108-113, Nov.-Dec. 2010. **(Best of R&D Track)**

5. B. Ramkumar, T. Bose, and M. S. Radenkovic, "Robust cyclic cumulants based multiuser automatic modulation classifier for cognitive radios," **Proc. SDR Wireless Innovation Conference**, pp. 127-132, Nov.-Dec. 2010.

6. B. Ramkumar, T. Bose, and M. S. Radenkovic, "Robust multiuser automatic modulation classifier for multipath fading channels, **Proc. IEEE DYSPAN**, Apr. 2010.

7. B. Ramkumar, T. Bose, and M. S. Radenkovic, "Combined blind equalization and automatic modulation classification for cognitive radios," **Proc. IEEE 13th DSP Workshop & 5th SPE Workshop**, pp. 172-177, Jan. 2009.

8. M. S. Radenkovic, T. Bose, and B. Ramkumar, "Blind adaptive equalization of MIMO IIR channels," **Software Defined Radio Technical Conference and Product Exposition**, Oct. 2008.

9. B. Ramkumar, T. Bose, J. H. Reed, and M. S. Radenkovic, "Combined blind equalization and automatic modulation classification for cognitive radios Under MIMO environment," **Software Defined Radio Technical Conference and Product Exposition**, Oct. 2008.

10. B. Ramkumar, and S. D Naidu, **"**Closed Loop Optimal Control Strategy for Cancer Chemotherapy**", proceedings of ASME/IMECE 2007***,*** paper no. IMECE 2007- 43527, Seattle, Washington.

11. B. Ramkumar, M. P. Schoen., and F. Lin, **"**Application of Intelligent Hybrid Optimization Technique for Parameter Estimation in Presence of Colored Noise**," proceedings of ASME/IMECE 2007***,*** paper no. IMECE 2006-13374, Nov 2007, Seattle, Washington.

12. B. Ramkumar, M. P. Schoen., F. Lin and B. G.Williams, **"**Hybrid Optimization Algorithm using Enhanced Continuous Tabu Search and Genetic Algorithm for Parameter Estimation,**" proceedings of ASME/IMECE 2006**, paper no. IMECE 2006-13374, Nov 2006, Chicago, Illinois.

SKILLS

- **Programming Languages**: MATLAB, C, C++, Python.
- **Platforms:** Windows 98/ME/2000/NT/ XP, Linux.
- **Tools:** Simulink, LabVIEW, MS Office, LATEX.

AWARDS AND ACTIVITIES

- Awarded the Taylor Graduate Fellowship award for outstanding academic performance by ISU, 2005-2006
- Awarded the NSF travel grant for attending IEEE DySPAN held at Singapore.
- Awarded the NSF travel grant for attending The Wireless Innovation Forum held at Washington D.C.
- Associate member of Sigma Xi, ISU chapter, 2006-2007.
- Student member of IEEE, 2008,2010.
- **Reviewer:** IEEE DySPAN, IEEE CrownCom, IEEE MILCOM, IEEE GLOBECOM, ASME/ IMECE and IEEE Transactions on Wireless Communication.

REFERENCES

- Professor Tamal Bose
  Professor of Bradley Department of Electrical and Computer Engineering,
  Associate Director of Wireless@VT,
  Virginia Tech, Blacksburg.
  Email: tbose@vt.edu

- Professor Marco P. Schoen
  Professor of Mechanical Engineering,
  Associate Director of Measurement and Control Engineering Research Center,
  Idaho State University.
  Email: schomarc@isu.edu

- Dr. Harris Volos
  Post Doc at Bradley Department of Electrical and Computer Engineering,
  Wireless@VT,
  Virginia Tech, Blacksburg.
  Email: hvolos@vt.edu

- Professor Jeffrey H. Reed
  Professor of Bradley Department of Electrical and Computer Engineering,
  Director of Wireless@VT,
  Virginia Tech, Blacksburg.
  Email: reedjh@vt.edu