

## Curriculum Vitae: Dipankar Raychaudhuri

### Summary:

Dipankar Raychaudhuri is Distinguished Professor, Electrical & Computer Engineering and Director, WINLAB (Wireless Information Network Lab) at Rutgers University. As WINLAB's Director, he is responsible for an internationally recognized industry-university research center specializing in wireless technology. He is the principal investigator for several multi-institutional projects supported by the US National Science Foundation (NSF) including: "MobilityFirst" future Internet architecture (FIA), "ORBIT" open-access wireless network testbed, and "SAVANT" inter-network dynamic spectrum collaboration. Dr. Raychaudhuri is also active in technology entrepreneurship and is a technical advisor to several government organizations and companies. Significant new technology contributions during his career include satellite data networks, HDTV, high-speed wireless LAN, ATM-based broadband technologies, cognitive radio, content delivery networks, the ORBIT radio grid testbed, and mobile Internet architectures & protocols.

### Education:

M.S. & PhD in Electrical Engineering, SUNY Stony Brook, NY (1978, 79)

B.Tech (Hons) in Electronics & Electrical Communications, IIT Kharagpur, India (1976)

### Work Experience:

2001-present: Distinguished Professor, ECE Dept & Director, WINLAB, Rutgers University

2008-09: Visiting Professor, EE Dept/Clean Slate Program, Stanford University

2000-01: Chief Scientist, Iospan Wireless, San Jose, CA

1993-99: Asst. GM & Dept Head (Systems Architecture), NEC USA C&C Research

1990-92 : Head, Broadband Communications Research, Sarnoff Corp, Princeton, NJ

1988-90: Senior Member of Technical Staff, Sarnoff Corp, Princeton, NJ

1979-87: Member of Technical Staff, RCA Laboratories, Princeton, NJ

### Research Profile:

Future network architectures and protocols, wireless systems and technology, dynamic spectrum access and cognitive radio, experimental prototyping and network research testbeds.

### R&D Highlights:

Principal Investigator or Lead for the following projects:

2014-present: MobilityFirst Next-Phase Future Internet Architecture Project (NSF FIA NP)

2012-present: Inter-network cooperation for dynamic spectrum access (NSF EARS)

2010-present: "MobilityFirst" Future Internet Architecture Project (NSF FIA)

2006-09: NSF FIND (Future Internet Design) projects on Cache-and-Forward (CNF) mobile content delivery and CogNet cognitive radio protocol stack

2005-present: NSF GENI (Global Environment for Network Innovation) Project – Planning Group Member (2005-07), Wireless Virtualization (2006-07) and Open WiMAX (2008-)

2005-06: WMPG (Wireless Mobile Planning Group) on Future Network Architecture

2003-present: ORBIT: Open-Access Research Testbed for Next-Generation Wireless Networks, featured in MIT Tech Review's "10 Emerging Technologies", 2008 (NSF supported)

2004-09: "WiNC2R" Network Centric Cognitive Radio Platform, NSF NeTS

2002-06: MUSE: Multimodal Sensor-on-Silicon Center-of-Excellence project, NJCST

2002-05: Dynamic Spectrum Management Policy and Technology, NSF NeTS

2001-06: Hierarchical Self-Organizing Ad-Hoc Wireless Network

2000-01: AirBurst: MIMO/OFDM system for broadband fixed wireless access

1995-99: WATMnet: 5 Ghz/25 Mbps mobile broadband wireless local area network

1994-98: QoS-aware software framework for ATM networks

1993-95: Multimedia network processor, MCCC

1991-92: Networking of high resolution video (HRV) workstation

1991-92: DirecTV/MPEG++ system design

1989-92: AD-HDTV system design & FCC prototype

1987-88: Packet-based digital video distribution system for CATV

1984-87: VSAT (very small aperture terminal) satellite data network design & prototype  
1978-85: Medium Access Control (MAC) protocols, SREJ-ALOHA, ARRA, packet CDMA

#### **Professional:**

Past Editor, IEEE Trans. on Networking, IEEE Trans. on Comm, IEEE Comm. Magazine, IEEE Multimedia and ACM M2CR  
Past Chair, Data Comm Systems Committee, IEEE ComSoc,  
Member, FCC ACATS (HDTV) System Analysis Task Force (1991-92)  
Vice Chairman, Wireless ATM Working Group, ATM Forum (1996-99)  
Member, Broadband Last Mile Committee, National Academies of Science & Engineering (1999-2002)  
Advisor for Future Mobile Network project, NICT, Japan (2002-06)  
Board of Directors, Semandex Networks, Inc., a Princeton, NJ based startup (2001-2008)  
Member of Scientific Council, Thomson Inc. (2004-10)  
Technical Advisory Board, NJ Economic Development Authority Edison Fund, (2005-present)  
Technical Advisory Board, NTT DoCoMo Laboratories, USA (2007-11)  
Advisor for Telecommunication Center-of-Excellence (TCOE) program, Govt. of India (2004-08)  
Member of NSF GENI (Global Environment for Network Innovation) Planning Group (2005-07)  
Chair, GENI Wireless Working Group (2006-07)  
Chair, Computing Coordination Council (CCC), Rutgers University (2007-12)  
Senior Advisory Board Member, 4WARD FP7 Project, European Commission, (2008-10)  
External Advisor, European Commission FP7 Smart Santander Project (2011-present)  
Advisory Board Member: Igolgi Inc, Zipreel Inc.(2012-present)  
International Advisory Board member, National Institute of Information and Communications Technology (NICT), Japan (2014-present)

#### **Publications & Patents:**

~200 journal and conference papers,  
~10 book chapters and edited book entitled "Emerging Wireless Technologies and the Future Mobile Internet" (with Mario Gerla), Cambridge University Press, 2011.  
~15 patents on various topics including broadband wireless networks, MAC protocols, digital video, VSAT networks.

#### **Representative recent papers/talks:**

1. Dipankar Raychaudhuri, Kiran Nagaraja, Arun Venkataramani, "MobilityFirst: a robust and trustworthy mobility-centric architecture for the future internet," ACM Mobile Computing and Communications Review 16(3): 2-13 (2012).
2. T. Vu, Akash Baid, Yanyong Zhang, Thu D. Nguyen, Junichiro Fukuyama, Richard P. Martin, Dipankar Raychaudhuri, "DMap: A Shared Hosting Scheme for Dynamic Identifier to Locator Mappings in the Global Internet," in Proceedings of ICDCS, 2012.
3. S. C. Nelson, G. Bhanage, and D. Raychaudhuri, "GSTAR: generalized storage-aware routing for MobilityFirst in the future mobile internet," in Proceedings of MobiArch, 2011, pp. 19-24.
4. A. Baid, T. Vu, D. Raychaudhuri, "Comparing Alternative Approaches for Networking of Named Objects in the Future Internet," 2012 IEEE Infocom NOMEN workshop.
5. D. Raychaudhuri, X. Jing, I. Seskar, K. Le, J. Evans, "Cognitive Radio Technology: From Distributed Spectrum Coordination to Adaptive Network Collaboration", *Journal of Pervasive and Mobile Computing*, 2008.
6. D. Raychaudhuri, "MobilityFirst: A Trustworthy and Robust Mobility-Centric Architecture for the Future Mobile Internet", Keynote Talk, IEEE PIMRC 2011, Toronto, Canada.
7. S. Paul, D. Raychaudhuri, R. Yates and J. Kurose, "The Cache-and-Forward Architecture for Efficient Mobile Content Delivery Services in the Future Internet", in *Proc. ITU Next Generation Networks (NGN)*, Geneva, May 2008.
8. Suli Zhao and D. Raychaudhuri, "Scalability and Performance Evaluation of Hierarchical Hybrid Wireless Networks", *IEEE Trans. on Networking* (2009)

9. Z. Wu, S. Ganu and D. Raychaudhuri, "IRMA: Integrated routing and MAC scheduling in multihop wireless mesh networks", in Proc. 2<sup>nd</sup> IEEE Workshop on Wireless Mesh Networks, (WiMesh) 2006, Reston VA, Sept 2006.
10. D. Raychaudhuri, I. Seskar, M. Ott, S. Ganu, K. Ramachandran, H. Kremo, R. Siracusa, H. Liu and M. Singh, "Overview of the ORBIT Radio Grid Testbed for Evaluation of Next-Generation Wireless Network Protocols," *Proceedings of IEEE Wireless Communications and Networking Conference (WCNC'05)*, March 2005.

**Most frequently cited papers:**

1. D. Raychaudhuri, et al, "WATMnet: A Prototype Wireless ATM System for Multimedia Personal Communication", *IEEE Journal of Selected Areas in Communications*, January 1997, pp. 83-95.
2. D. Raychaudhuri and N. Wilson, "ATM Based Transport Architecture for Multiservices Wireless Personal Communication Network", *IEEE Journal of Selected Areas in Communications*, October 1994, pp. 1401-1414. [ISI "Most Cited Paper" with over 2200 citations]
3. K. Joseph, S. Ng, D. Raychaudhuri, R. Saint Girons, T. Savatier, R. Siracusa and J. Zdepski, "MPEG++: A Robust Compression and Transport System for Digital HDTV", *Image Communications*, (1992), pp. 307-323.
4. D. Raychaudhuri, "Design of Ku-band Satellite Data Networks Using Very Small Aperture Terminals - Part I: Multiaccess Protocols," *International Journal of Satellite Communications*, July-Sept, 1987, pp.195-212.
5. D. Raychaudhuri, "Stability, Throughput and Delay of Asynchronous SREJ ALOHA," *IEEE Trans. on Communications*, July 1987, pp. 767-772.
6. D. Raychaudhuri, "Announced Retransmission Random Access Protocols," *IEEE Trans. on Communications*, Nov. 1985, pp. 1183-1190.
7. D. Raychaudhuri, "Performance Analysis of Random-Access Packet-Switched Code Division Multiple Access Systems," *IEEE Transactions on Communications*, June 1981, pp. 895-901.

**AWARDS**

IEEE Donald J. Fink Best Paper Award (2014)

Distinguished Alumni Award, Indian Institute of Technology, Kharagpur (2012)

Schwarzkopf Prize for Technological Innovation (2008)

ISI "most frequently cited author" in the field of communications during 1985-2005 (2006)

Fellow of IEEE (1995)

Sarnoff Team Award for Development of the AD-HDTV System (1990)

RCA Outstanding Technical Achievement Awards (1982, 83 and 85)