

ASHUTOSH DUTTA, Ph.D.

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Accomplished networking and computer science expert with 30 years of experience directing multiple IT operations, research and development for leading global technology corporations and top universities. Seasoned Mobility and Security Architect, Chief Technology Officer, Senior Scientist, Adjunct Professor IEEE Distinguished Lecturer, and project manager with in-depth expertise in developing and implementing research, analysis, and design initiatives. Expertise in computer communication, wireless networking, LTE networks, Software Defined Networking (SDN), Network Function Virtualization (NFV), 5G, and mobility management. Author of 30 issued patents and 80 publications. Author of Mobility and Handover Optimization book, Editor-in-chief for Journal of Cybersecurity and Mobility published by River Publishers. Producer and collaborator of winning Commercial, FirstNet, DOD and National Science Foundation proposals and creating strategies to enhance business development and promote long-term growth. Team leader with a reputation for fostering strong client relations and building staff that consistently meet expectations. Volunteer and Leadership positions in professional societies such as IEEE/ACM (Director of Marketing and Industry Relations, IEEE Communication Society, IEEE 5G Initiative Founding Co-Chair, MGA Liaison to IEEE History Committee and Region 1 ECS Chair).

Research & Development • Proposal Writing • Technical Leadership • Process Analysis • Project Execution • Due Diligence • University Relation • Cybersecurity • Data Mining • Machine Learning • Deep Learning • Cloud Computing • Multi-Disciplinary System Development • Mobility Management • SDN/NFV • VoIP • IMS • LTE • 5G • IOT • IPv6 • Ad Hoc Networking • IT Operations • Strategic Planning • Business Development • Pre-University (K-12) • Industry Relation • Standards

EDUCATION

Doctor of Philosophy in Electrical Engineering, Columbia University, New York, NY

Advisor: Prof. Henning Schulzrinne

(Committee: Prof. Nick Maxemchuk, Prof. Yechiam Yemini, Prof. Dan Rubenstein, and Dr. Bryan Lyles)

Ph.D. Thesis: Systems Optimization for Mobility Management

Master of Philosophy in Electrical Engineering, Columbia University, New York, NY

Master of Science in Computer Science, New Jersey Institute of Technology, Newark, NJ,

Bachelor of Science in Electrical Engineering, National Institute of Technology, Rourkela, India

PROFESSIONAL EXPERIENCE

AT&T, Middletown, New Jersey • 02/2013 – Present

Leading Wireless Service Provider and R&D Organization

PMTS/LMTS/Director AT&T Labs, Middletown, New Jersey

As Lead 5G Architect (Security) interact with the key 5G vendors, operators, and researchers around the world and drive the 5G related research agenda while providing technical leadership in 5G. As a Subject Matter Expert in 5G Security, collaborate internally and externally to define the strategy for emerging 5G security research and development for AT&T's networks. Collaborate with the key security vendors, develop use cases and conduct 5G security proof-of-concept for mobility networks. Develop 5G security requirements and collaborate with mobility architecture team for deployment. Participate in and contribute to various standards bodies, namely IEEE, NGMN, 3GPP, ETSI/NFV, and IETF in a leadership role. Served as lead role for security for winning proposal for FirstNet Security in AT&T's network.

As the Director of Technology Security, lead the team responsible for security for mobile core networks, driving open source standards, security requirements, RFPs, and proofs-of-concepts for various network

function virtualization (NFV) related to security. Lead the team in driving security function virtualization requirement, vendor engagement and patents for SDN/NFV. Drive the innovation for security technology for Domain 2.0 deployment in AT&T's networks by leading the security standards and proofs-of-concept in the D2 Security lab. Lead research and development collaboration with universities and other research Labs in the area of SDN/NFV security. Served as the security lead for FirstNet winning proposal team.

As a leading technical member of the CTO, CSO and IT organization, lead the design and deployment of advanced security architecture for the mobile enterprise and 4G LTE networks using cloud computing and virtualization. Responsible for leading overall end-to-end security design for both mobility networks and User Defined Network Cloud (UDNC), including 3G and LTE architectures and services. Collaborate with other organizations within AT&T, standards forums, external vendors, customers and universities to effectively design and deploy the security architecture for network function virtualization. Active participation in ETSI NFV, IEEE, IETF standards forums. Lead and direct the proof-of-concept of relevant virtualization security features leading to the deployment in AT&T's Domain 2.0 network.

New Jersey Institute of Technology, Newark, New Jersey • 09/2015 - Present

Leading higher education university and research institution.

Adjunct Faculty in Electrical Engineering and Computer Science Department

As a part-time adjunct faculty teach graduate level courses (evening), namely Computer Network Design Analysis (CNDA) and Internet and Higher Layer Protocols (IHLP), respectively in Electrical Engineering and Computer Science Department at NJIT.

NIKSUN Inc., Princeton, New Jersey • 09/2010 – 02/2013

Leader in network forensics, compliance, security surveillance and performance management solutions ranging from core infrastructure to edge and branch environment for both wired and wireless networks.

CTO Wireless and Executive Director, NIKSUN Innovation Center & Quality Assurance

Reporting to the CEO of the company, direct the research and development of LTE (Long Term Evolution) security and monitoring solutions for NIKSUN Cybersecurity product. As the CTO of wireless technologies, developed the mobility monitoring product by working with the engineering team and managed the deployment of mobility solutions for NIKSUN 4G products in the service provider networks around the world. Worked through the whole product life cycle starting from concept to product realization and eventual marketing of the product. As the head of NIKSUN Innovation Center (17 members), and QA department (12 members) supervise the staff and research activities leading to product development and quality assurance of future NIKSUN products. As CTIF-USA co-director manage university collaboration for research projects.

TELCORDIA TECHNOLOGIES, Piscataway, New Jersey • 10/1997- 08/2010

Global leader in the development of mobile, broadband, and enterprise communications software and services with 800-plus customers in 55 countries.

Senior Scientist/Project Manager/Principal Investigator Applied Research

Direct research and development initiatives of VoIP and wireless technologies. Manage all aspects of project development and delivery. Supervise ongoing project activities and serve as technical lead to ensure expectations and quality assurance standards were consistently met. Lead design of network systems and supervise direct development of prototypes. Collaborate among industry, university and government representatives to increase communication and support project implementation. Organize and lead the team for analysis and modeling to create processes to improve efficiency and record progress. During my 13 years at Telcordia Research, I have initiated major commercial and government

projects and acted as PI (Principal Investigator) and Co-PI for these multi-year contracts covering the range of **\$250,000 to \$4,000,000** for each of these projects. Total funding of the projects where I was a PI or Co-PI is approximately (~ **\$20,000,000**).

Major Contributions:

COMMERCIAL:

- Principal Investigator and project manager for KDDI's IMS project (**\$4,000,000 over 5 years**) to design and build IMS/MMD network for next generation networks, including contributing to design of SIP, mobility, and security tasks to ensure progress and desired results were achieved.
- As Co-PI, supervised all operational phases of CERDEC project (**\$200,000**), including customer interaction, design development, software delivery, and on-site product demonstration.
- As the Co-PI for the mobility task (**\$4, 500,000 over 9 years**), led technical initiatives for Third Generation Mobile Wireless Internet Architecture (IMT-2000) based on CDMA-2000 standard and transition to 4G network. Implemented all mobile multimedia comprehensive test-bed involving various Linux-based systems, Cisco routers, wireless base stations, and subnets. Lead architect for secured universal mobility project and mobile VPN project involving heterogeneous access networks (e.g., 802.11, CDMA, WiMAX).
- Co-PI and Technical Lead for Toyota's mobile content delivery network (**\$1000, 000 over two years**) in all IP wireless environment involving advanced Telematics features. Project involved designing and implementing SIP-based mobility management and Localized Multicast-based architecture.
- As the co-PI of the Horizons Research Program, directed analysis and design of scalable session control architecture for the building of multi-service platforms for leading clients KT, BellSouth, Telenor, and Toyota. This specific part of the program generated a revenue of (**\$1,500,000 over three years**).
- Collaborated with ITSUMO QoS team involved in performance analysis of voice and data traffic in an 802.11b networking environment utilizing various priority queuing, traffic control mechanism, and Spectra Link Voice Priority (SVP).
- Performed feasibility study for supporting IPv6 in mobile Ad Hoc networks. Conducted experiments under Joint User Interoperability Communications Exercise using both satellite and terrestrial networks to study the performance of VoIP and Streaming traffic.

GOVERNMENT:

- As Co-Principal Investigators (Co-PI) for DARPA ACN project (**\$2,500,000 over three years**), led in writing the winning proposal for Integrated Mobility Management for phase II and phase III, and have been acting as a Technical lead for the Integrated Mobility Management part of the project. This involved designing and implementing an Integrated Mobility Management scheme for Adhoc type military networks while coordinating between different task groups, presenting regular milestone reviews at DARPA meetings.
- As a Co-PI and technical lead for a DARPA funded AJCN project (**\$1,500,000 over two years**), involved in the design, development and prototype demonstration of a SIP based multiparty conference control using both multicast and MCU-based (multi-party conferencing unit) approaches aided by SIP's third-party call control features. Above two have resulted in 10 paper publication and 3 patent application.
- Principal Investigator (PI) for CERDEC/CECOM's winning proposal on IPv6 transition of US Army's networks (**\$300,000**). Designed and developed IPv6 transition technologies for Army's legacy applications.

- As a technical lead for a subcontract to Lockheed to provide IMS capabilities for DARPA National Cyber Range (NCR), designed and architected IMS testbed and designed the interface between IMS and PSTN. This activity includes interconnection of IMS test-beds at different locations.
- As the Co-PI and technical lead for National Communication System (NCS)'s multi provider service provider testbed (**\$500,000**), led a group of 4 that designed and architected priority services for VoIP and streaming services over an IMS platform using GETS (Government Emergency Telecommunications Service) requirement. This activity involved designing priority-based services at layer 2, layer 3 and SIP layer

COLUMBIA UNIVERSITY, New York City, New York • 10/1989 - 09/1997

Leading higher education university and research institution.

Director of IT Operations (Central Research Facilities)

Managed and supervised a staff of 10 for daily IT operations and administration of systems and programs, including Suns, HPs, SGIs, and PCs, in multi-protocol based heterogeneous network with 600 servers. Installation, testing, and maintenance of various kinds of communication software, hardware and networking products of Central Research Facility. That includes departmental TCP/IP based Cisco routers, terminal servers, dialup modems, Fast Ethernet, FDDI concentrators, ATM backbone, and 3Com Link Builders. Supervised and motivated IT teams to achieve desired outcomes. Coordinated with faculty, staff, and students to promote research initiatives. Organized and collaborated on National Science Foundation (NSF) proposals for department research objectives. Maintained (**\$4,000,000**) million NSF computing infrastructure budget. Led the construction of modern computing facilities in newly built CEPSR building.

Tata Engineering and Locomotive Company, India • 08/1985 – 09/1987

Computer Engineer

Installed and maintained mainframe Burroughs B6800, mini B1900, VAX 11/750, 11/780, and their associated communication peripherals like disk and tape drives, line printers, plotters, and various types of intelligent terminals, modems and multiplexer. Designed the interface for setting up the communication link between a cluster of microcomputer systems and mainframe using Poll/Select protocol at different sites of the company.

PROFESSIONAL SOCIETY AFFILIATIONS

Institute of Electrical and Electronics Engineers (IEEE), Senior Member
Association of Computing Machinery (ACM), Senior Member

TECHNOLOGY SKILL HIGHLIGHTS

Hardware Platform: SUN, HP, IBM, DEC, SGI, HP, Cisco Routers, Ethernet Switches (XYLAN, 3COM, Cisco), Nortel PBX

Operating Systems: Linux, Windows, Sun OS /Solaris, BSD, VMS, AIX, HP-UX, MS-DOS, OS/2

Protocols & Software: SIP, SAP, SDP, RTP/RTCP, RTSP, TCP/IP, DNS, NFS, H.323, Multicast, Mobile IP, PMIPv6, IPv6, FMIPv6, Cellular IP, WiFi, Bluetooth, CDMA-2000, IPSec, ATM, SONET, OPNET, NS2, Shell, Sybase, Informix, My-SQL, RDF, SOAP, IMS, LTE, Diameter

Standards Activities: IEEE 802.11, IEEE 802.21, IETF, 3GPP, 3GPP2, ATIS, GISFI, ETSI/NFV

Languages: Java, HTML, XML, C, C++, Fortran, Pascal, Lisp, Python, Assembly Languages

Security: SNORT, Virtual Firewalls, IDS/IPS, DDOS, AKA, WPA, IPSec, TLS

AWARDS AND PATENTS

30 patents awarded, 8 patents (pending)
IEEE Communications Society Distinguished Lecturer
IEEE 2009 MGA (Membership Geographic Activities) Leadership Award
IEEE 2010 Professional Leadership Award, IEEE-USA
IEEE Region 1 award for outstanding section leadership for Princeton/Central Jersey Section
IEEE-USA 2011 Regional Leadership Award
CEO awards from Telcordia Technologies (2000 and 2002)
6 times recipient of DARPA Merit Award for Technical Excellence for Integrated Mobility Management in the Air-Borne Communication Node project
Best Paper Award from ESTC (SAIC), IEEE, EIT 2005, IEEE IMSAA 2009
2005 Leadership Award from IEEE-PCJ Section
Several Recognition awards from the Vice-President of Telcordia Research Labs
Recognition award for serving as a Publicity Co-Chair in Mobicom 2000, Boston
AT&T CSO Security Team Award, 2013

30 Patents granted:

1. *US patent 6,992,994* - Methods and systems for a generalized mobility solution using dynamic tunneling agent
2. *US Patent 7,184,418* - Method and system for host mobility management protocol
3. *US Patent 7,296,091*- System and method for receiving over a network a broadcast from a broadcast source
4. *US patent 7,319,689* - Method for handling the simultaneous mobility of mobile hosts in infrastructure-based networks
5. *US patent 7,546,082* - Application-layer multicast for mobile users in diverse networks
6. *US patent 7,664,501* - Seamless handoff across heterogeneous access networks using a handoff controller in a service control unit
7. US Patent, 7,738,882 - Framework of media-independent pre-authentication improvements: including considerations for failed switching and switchback
8. US Patent, 7,768,975 - Fast handoff using GPS technology for mobile telematics
9. US Patent 7,813,319 - Framework of media-independent pre-authentication
10. US Patent, 7,936,719 - Packet loss prevention during handoff using packet copy-and-forward –
11. US Patent 7,978,655 - Secure and seamless WAN-LAN roaming
12. US Patent, 8,068,460 - Dynamic Packet Buffering System for Mobile Handoff
13. US Patent 8,098,627 - P-CSCF Fast Handoff for IMS/MMD Architecture
14. US Patent 8,190,768 – Network Selection Mechanism
15. US Patent 8,341,395– Media Independent Handover Protocol Security
16. US Patent 8,259,682– Framework of media-independent pre-authentication
17. US Patent 8,243,687– Secure and seamless roaming
18. US Patent 8,446,875– Media Independent Pre-authentication supporting fast-handoff in Proxy MIPv6 Environment
19. US Patent 8,442,005– Seamless Handoff Across Heterogeneous Access Networks Using a Handoff Controller in a Service Control Unit
20. US Patent 8,565,186 – Methods of Mitigation of Trombone Routing in an IMS/MMD Network
21. US Patent 8, 625, 551 – Flexible Mobility Framework for Heterogeneous Roaming in Next Generation Wireless Networks
22. US Patent 8,670,407 – Proxy Mobile IP
23. US Patent 8.701,164 Key Caching, QoS and Multicast extensions to media-independent pre-authentication
24. US Patent 8,717,931 – Network Discovery Mechanisms
25. US Patent 8,718066 – Fast handoff using GPS technology for mobile telematics
26. US Patent 8,792,454 - Secure and seamless WAN-LAN roaming

27. US Patent 8, 929330 – Network Discovery Mechanisms
28. US Patent 8,971,291 – P-CSCF fast handoff for IMS/MMD Architecture
29. US Patent 9,025,771 – Security Optimization for IMS/MMD Architecture
30. US Patent 9,094,412 – Self Organizing IP Multimedia Subsystem

Professional Activities:

Section/Society/Region/MGA:

- Director of Industry Outreach, IEEE ComSoc Board of Governor 2014-current
- IEEE Distinguished Lecture, IEEE Communications Society 2016-2018
- Founding Co-Chair IEEE 5G Initiative
- IEEE MGA Liaison to History Committee
- IEEE MGA Industry Relation Chair 2009-2012
- IEEE MGA Pre-University Coordinator 2012-2013
- Chair, IEEE Princeton / Central Jersey Section (2008-2009)
- Vice-Chair, IEEE Princeton / Central Jersey Section (2006-2007)
- Treasurer, IEEE Princeton / Central Jersey Section (2004 – 2005)
- Secretary, IEEE Princeton / Central Jersey Section (2003)
- IEEE Region 1 Industry Relation Coordinator (2008-2011)
- IEEE ComSoc Public Visibility Committee Chair
- Associate Technical Editor – IEEE Communication Magazine
- Editor-in-chief - Journal of Cyber Security and Mobility (Published by River Publishers)
- Vice Chair, IEEE Education Society, Princeton / Central Jersey Section
- Vice Chair, IEEE Communication Society, Princeton / Central Jersey Section
- Co-Chair, Service Oriented Network – Global ICT Standardization for India (GISFI)
- Co-Director CTIF-USA an Industry-Academic Collaboration
- Editor-in-chief, Journal of Cyber Security and Mobility

Conferences:

- IEEE Sarnoff Symposium 2005 – General Chair
- IEEE Sarnoff Symposium 2004 – Exhibits Chair
- IEEE IMSAA 2009 – TPC Co-Chair, IMSAA 2010 – General Chair
- IEEE IMSAA 2011, IEEE Sarnoff Symposium - Steering Committee Member
- ACM Mobicom 2000 – Publicity Co-Chair
- ACM Multimedia 2004 – Finance Chair
- IEEE STEM (Science Technology Engineering Math) General Co-Chair 2011-17
- IEEE 5G World Forum – General Co-Chair
- World Wide Security and Mobility Conference – TPC Co-chair (2011-2012)
- TPC Member of several IEEE and ACM Conferences (e.g., ICC, Globecom, Infocom, Mobicom, WoWMoM, MobiSec, Mobisys, MILCOM)

PUBLICATIONS (Book, Book chapters, Papers, IETF drafts, RFC)

Book (Published May, 2014): A. Dutta, H. Schulzrinne, *Mobility Protocols and Handover Optimization: Design, Evaluation and Application*, John & Wiley Publication
(This book has also been translated into Chinese Language)

Book Chapters:

A. Dutta, C. Makaya et al., “Self-Organizing IP Multimedia Subsystem, , Advances in Next Generation Services and Service Architectures, published by River Publishers

A.. Dutta, H. Schulzrinne, D. Wong, "Supporting Continuous Services to Roaming Clients, CRC Press, Edited by Paolo Bellavista and Antonio Corradi

D. Wong, **A. Dutta** Network Layer Mobility Protocol for IPv6, Encyclopedia of Internet Technologies edited by Freire and Pereira

K. D. Wong, Hung-Yu Wei, **A. Dutta**. K. Young and H. Schulzrinne, "IP Micro-Mobility Management using Host-Based Routing in the book Wireless IP and Building the Mobile Internet, Edited by Dixit, and Prasad, Artech House Publication

Journal Publications:

1. **A. Dutta** et al., Realization of Wireless Internet Telephony and Streaming Multimedia Testbed, Elsevier Journal for Computer Communication, October 2003
2. **A. Dutta**, S. Madhani, H. Schulzrinne et al., "Optimized Fast-handoff Scheme for Application Layer Mobility Management" MC2R November Issue, and Mobicom 2002,
3. **A. Dutta**, T.Zhang, S. Madhani, K. Taniuchi, K. Fujimoto, Y. Katsube, Y. Ohba, H. Schulzrinne Secure Universal Mobility for Wireless Internet, (Extended version) ACM MC2R, 2004
4. T. Zhang, E. Van Denberg, S. Madhani, **A. Dutta**, "Mobile information services enabled by mobile publishing (MIS- MP)", Wireless Networks, Springer Netherlands Publication
5. T.Chiba, H.Yokota, A.Idoue, **A.Dutta**, S.Das, Fuchun J. Lin, H.Schulzrinne, "Gap Analysis and Deployment Architectures for 3GPP2 MMD Networks," IEEE VT Magazine, March 2007
6. **A.Dutta**, Jasmine Chennikara, Wai Chen, O. Altintas, H. Schulzrinne, "Mobile Content Distribution for Streaming Multimedia,"IEEE Communication Magazine, October 2003
7. **A. Dutta** et al, " Seamless proactive handover across heterogeneous access networks," Wireless Personal Communication, Springer Journal, August 2007
8. **A. Dutta** et al, "Mobility Testbed for 3GPP2-based MMD Networks, IEEE Communication Magazine, July 2007
9. **A. Dutta** et al., "Media-Independent Pre-authentication supporting secure inter-domain handover optimization," IEEE Wireless Communication Magazine, April 2008
10. K. Taniuchi, Y. Ohba, V. Fajardo, S. Das, Y-H Cheng, **A. Dutta** et al., "IEEE 802.21: Media independent handover: Features, applicability, and realization," IEEE Communication Magazine Jan 2009
11. **A. Dutta** et. al., IEEE 802.21: Media Independent Handover: Features, Applicability, and Realization, IEEE Communication Magazine, January 2009
12. **A.Dutta** et al., "MarconiNet: Overlay Mobile Content Distribution Network," IEEE Communication Magazine February 2004
13. M. Taulil, **A. Dutta**, H. Schulzrinne et al. Realization of MIH Services and Media Independent Pre-authentication (Extended version), Inderscience Journal, December 2009
14. A. Misra, S. Das, **A. Dutta**, A. McAuley, S. K. Das, IDMP-based Fast Handoffs and Paging in IP-Based 4G Mobile Networks, IEEE Communication Magazine March 2002
15. D. Wong, **A. Dutta**, R. Jain, K. Young, H. Schulzrinne, "A Multilayered Mobility Management Scheme for Auto-configured wireless networks," IEEE wireless magazine, October 2003
16. Shankar Lal, Tarik Taleb, **A. Dutta**, "NFV: Security Threats and Best Practices," IEEE Communications Magazine, May 2017

Invited Papers:

1. **A. Dutta**, E. Van den berg, H. Schulzrinne, et al, " Dynamic Buffering Scheme for Mobile Handoff", IEEE PIMRC 2006
2. **A. Dutta**, S. Das, T.Chiba, H.Yokota, I. Idoue, "Comparative Analysis of Network Layer and Application Layer IP mobility protocols for IPv6, " IEEE WPMC 2006
3. **A. Dutta**, H. Schulzrinne, SIP Mobility at SIP Summit 2001 in Dallas, organized by pulver.com
4. **A. Dutta**, Raquel Morera, **A. McAuley**, **Nim Cheung**, **Ken Young**, Cross Layer Optimization and Adaptation in Wireless Mobile Ad Hoc Networks, NRL Workshop on Cross Layer Issues, Washington D.C, June 2nd-3rd 2004.
5. F. Vakil, **A. Dutta**, Henning Schulzrine, Mobility Requirement for SIP, SIP Forum 2000, Paris

Conference Publications:

1. **A. Dutta**, Henning Schulzrinne, "A Streaming Architecture for Next Generation Internet," , ICC 2001, Helsinki, Finland
2. **A. Dutta**, F. Vakil, M. Tauil, S. Baba, N. Nakajima, H. Schulzrinne, "Application Layer Mobility Management Scheme for Wireless Internet, 3G Wireless 2001, San Francisco, May 2001.
3. **A. Dutta**, Henning Schulzrinne, Wai Chen, Onur Altintas, "Mobility Support for Wireless Streaming Multimedia in MarconiNet," in IEEE Broadband Wireless Summit, Interop 2001, (Las Vegas), May 2001.
4. **A. Dutta**, Yechiam Yemini, "Power Management of LEOs under bursty broadband traffic. 17th International Communications Satellite Systems Conference, February 1998, Yokohama, Japan.
5. **A. Dutta**, Henning Schulzrinne, Yechiam Yemini, "MarconiNet – An Architecture for Internet Radio and TV Networks. 9th International workshop on Network Support for Digital Audio Video (NOSSDAV), June 1999, New Jersey.
6. K. Chakrabarty, A. Misra, S. Das, A. McAuley, **A. Dutta** and S. K. Das "Implementation and Performance Evaluation of TeleMIP," in ICC, (Helsinki), June 2001,
7. A. Misra, S. Das, **A. Dutta**, A. McAuley and S. K. Das "IDMP-based Fast handoffs and paging in ip-based cellular Networks," in 3GWireless 2001, (San Francisco), May 2001
8. S. Das, A. Misra, A. McAuley, **A. Dutta** and S. K. Das, "A generalized mobility solution using a dynamic tunneling," in ICCCD2000, (Kharagpur, India), pp. 4, Dec. 2000.
9. A. Misra, S. Das, A. McAuley, **A. Dutta** and S.K. Das, "Integrating QoS Support in TeleMIP's Mobility Architecture," in ICPWC, (Hyderabad, India), Dec. 2000,
10. **A. Dutta**, J.C Chen, S. Das, A. McAuley, H. Schulzrinne "Building a Test-bed for Mobile Multimedia," Proceedings of Globecom 2001, San Antonio, Texas,
11. K. Daniel Wong, Hung-Yu Wei, **A. Dutta**, Kenneth Young, H. Schulzrinne "Performance of IP Micro-Mobility Management Schemes using Host Based Routing.", WPMC 01, Denmark
12. O. Altintas, **A. Dutta**, W. Chen, H. Schulzrinne Mobility Management Approaches for all IP Wireless Networks, SCI 2002
13. **A. Dutta**, Jim Burns, R. Jain, Henning Schulzrinne, Ken Young, "A Multi-layered Mobility Management Scheme for Survivable Network, IEEE Milcom 2001, Vienna, VA
14. **A. Dutta**, Daniel Wong, H. Schulzrinne, "Realization of Integrated Mobility Management Protocol for Ad-Hoc Networks", Milcom 2002, et al.
15. **A. Dutta**, H. Schulzrinne, S. Das, Wai Chen "MarconiNet supporting Streaming Media over Localized Wireless Multicast" et al. Mobi-commerce, September 2002
16. J. Chennikara, W. Chen, **A. Dutta**, O. Altintas, "Application Layer Multicast for Mobile Users in Diverse Networks", IEEE Globecom 2002
17. N. Nakajima, **A. Dutta**, S. Das, H. Schulzrinne, "Handoff Delay Analysis for SIP Mobility in IPv6 Testbed," IEEE ICC 2003,
18. Ping-yu Hsieh, **A. Dutta**, H. Schulzrinne, "Application Layer Mobility Proxy for Real-time communication," 3G Wireless 2003,
17. Daniel Wong, **A. Dutta**, H. Schulzrinne, Ken Young Managing Simultaneous Mobility of IP Hosts, , IEEE MILCOM 2003
18. F. Anjum, M. Elaoud, D. Famolari, A. Ghosh, R. Vaidyanathan, **A. Dutta**, "Voice Performance in WLAN Networks, An Experimental Study," IEEE Globecom 2003
19. **A. Dutta**, S. Das, P. Li, A. McAuley, S. Baba, Y. Ohba, H. Schulzrinne, "Secure Mobile Multimedia Communication for Wireless Internet," IEEE ICNSC 2004, Taipei
20. S. Khurana, **A. Dutta**, P. Gurung, H. Schulzrinne, "XML based wide area communication with networked Appliances, IEEE Sarnoff Symposium 2004.
21. **A. Dutta**, T. Zhang, S. Madhani, K. Taniuchi, H. Schulzrinne, "Secure Universal Mobility for Wireless Internet," WMASH Workshop, October 2004, Philadelphia, PA

22. J. Chennikara, **A. Dutta**, A. Cheng, I. Sebuktekin, A. McAuley, H. Schulzrinne, Integrated Networking Technologies for a Survivable Network, IEEE WCNC 2005,
23. **A. Dutta**, S. Madhani, W. Chen, O. Altintas, H. Schulzrinne Fast-handoff Schemes for Application Layer Mobility Management, IEEE PIMRC 2004, Spain
24. **A. Dutta**, R. Jain, J. Burns, D. Wong, K. Young, H. Schulzrinne, "Performance Evaluation of Application Layer MIP-LR", IEEE Wirelescom 2005
25. **A. Dutta**, T. Zhang, K. Taniuchi, Y. Ohba, H. Schulzrinne MPA assisted Optimized Proactive Handoff Scheme, ACM Mobiquitous 2005
26. **A. Dutta**, B. Kim, T. Zhang, S. Baba, K. Taniuchi, Y. Ohba, H. Schulzrinne Experimental Analysis of Multi Interface Mobility Management with SIP and MIP, IEEE Wirelescom 2005
27. D. Wong, **A. Dutta**, Simultaneous Mobility in MIPv6, IEEE, EIT 2005, Lincoln, Nebraska (**Best Paper**)
- 30 T. Zhang, S. Madhani, **A. Dutta**, E. Van den Berg, Y. Ohba, K. Taniuchi, , S. Mohanty Implementation and Evaluation of Autonomous Collaborative Discovery of Neighboring Networks, ITRE 2005
- 31 **A. Dutta**, H. Schulzrinne et al, "Seamless Mobility Across Heterogeneous Access Networks – An 802.21 Centric Approach, WPMC 2005
- 32 **A. Dutta**, H. Schulzrinne et al., , "Flexible Call Control Framework supporting Multi-party service integration", IEEE MILCOM 2005
- 33 **A. Dutta**, S. Madhani, Wai Chen, Onur Altintas, H. Schulzrinne, GPS-IP based fast-handoff approaches for Mobiles, 2006 IEEE Sarnoff Symposium
28. **A. Dutta**, S. Das, D. Famolari, Y. Ohba, K. Taniuchi, T. Kodama, "Secured Seamless Convergence across Heterogeneous Access Networks," World Telecommunication Congress 2006,
29. **A. Dutta**, S. Madhani, T. Zhang, Y. Ohba, K. Taniuchi, H. Schulzrinne Network Discovery Mechanism for Fast-handoff, IEEE Broadnets 2006, San Jose
30. **A. Dutta**, Bryan Lyles, H. Schulzrinne, et al, " IPv6 transition techniques for legacy application", IEEE MILCOM 2006
31. T. Chiba, H. Yokota, A. Idoue, **A. Dutta**, K. Manousakis, S. Das, H. Schulzrinne Trombone Routing Mitigation Techniques for IMS/MMD Networks, IEEE WCNC 2007
32. T. Chiba, H. Yokota, A. Idoue, **A. Dutta**, S Das, Fuchun J. Lin, H. Schulzrinne, " Mobility Management Schemes for Heterogeneity Support in Next Generation Wireless Networks, Euro NGI 2007
33. **A. Dutta**, Bryan Lyles, H. Schulzrinne, Jiacun Wang, "Generalized Modeling Framework for Handoff Analysis," IEEE PIMRC 2007
34. A. Dutta, S. Chakraborty, H. Schulzrinne, " An Experimental Study of Location Assisted Proactive Handover," IEEE Globecom 2007, Internet Protocol Symposium
35. Y. Ohba, S. Das, A. Dutta, "Kerberized Handover Keying: A Media-Independent Handover Key Management Architecture," MobiArch 2007
36. R. M. Lopez, A. Dutta, Y. Ohba, A. Dutta, H. Schulzrinne, A.F Gomez Skarmeta, Network-Layer Assisted Mechanism to Optimize Authentication Handoff Delay in 802.11 Networks, ACM Mobiquitous 2007
37. A. Dutta, T. Chiba, S. Das, H. Schulzrinne, " Architecture Analysis and Experimental IPv6 Testbed for Advances in IMS, IMSAA 2007, December 2007, Bangalore, India
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45. **A. Dutta**, B. Lyles, H. Schulzrinne, "A Formal Approach to mobility," IEEE COMSNETS 2011, Bangalore, India
46. S. Komorita, **A.Dutta**, H.Schulzrinne, "*User-transparent Reconfiguration Method for Self-organizing IP Multimedia Subsystem*, 16th IEEE Symposium on Computer and Communication, 2011
47. Parag Pruthi, Ashutosh Dutta, Niranth Amogh, and Ritesh Kalle, Convergence through Next Generation Cloud and Service Oriented Networks in Indian Scenario, Journal of ICT Standardization, Vol I, 2013
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1. Editor-in-Chief, Journal of Cyber Security and Mobility, River Publishers
2. Seshadri Mohan, Nitin Agarwal, and Ashutosh Dutta. "Social Networks meet Mobile Networks". IEEE Communications Magazine. Vol. 50, Issue 6, pp. 72-73. June 2012.
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5. IEEE Journal on Selected Areas in Communications, Emerging Technologies in Software-Driven Communication (expected November 2017), Marcus Brunner, Ashutosh Dutta, Mathias Fischer, Toktam Mahmoodi

Tutorials/Invited Talks/Panels:

Tutorials:

1. Globecom 2002 Tutorial on "Mobile Wireless Internet Technologies", P. Agrawal, **A.Dutta**, J.C Chen et al.
2. IEEE Sarnoff Symposium (2003) Tutorial on "Mobility Management for Next Generation Networks", **A.Dutta**, D. Wong
3. Globecom 2003 Tutorial on "Mobility Management for Next Generation Wireless Networks", D. Wong and **A. Dutta**
4. IEEE Comsoc online Tutorials Now, Daniel Wong, **Ashutosh Dutta**
5. IEEE WCNC 2008, IP-based mobility protocols and optimization framework, **Ashutosh Dutta** (accepted for Online Tutorial also)
6. IEEE WCNC 2011, IP-based mobility and handover optimization, **Ashutosh Dutta**, Anthony Chan
7. IEEE ComSoc Tutorials Now, 2015 on Mobility Protocols and Handover Optimization, **Ashutosh Dutta**
8. IEEE ICC 2016, Security Virtualization and LTE Security, **Ashutosh Dutta**, Roger Piqueras

Invited Talks/Panels:

9. IEEE ICC 2017, 5G Research, Standardization, and Development, Panelist
10. IEEE ICC 2017, Challenges and Opportunities in SDN/NFV and 5G Security, Panel Coordinator
11. ETSI Security Week - Security Challenges and Opportunities for SDN/NFV and 5G Networks - A Standards Perspective – Keynote Speaker
12. IEEE 5G Summits – Overview of IEEE 5G and Beyond Initiative (2016, 2017)
13. Security Challenges and Opportunities in SDN/NFV and 5G Networks, 5G World, London, 2017
14. Security Challenges in Network Function Virtualization (NFV), IEEE Globecom 2014
15. 10 IEEE Communications Society Distinguished Lecture Talks on 5G Security

IETF, ETSI Drafts/RFCs:

1. A. Dutta, Y. Ohba, K. Taniuchi, V. Fajardo, H. Schulzrinne, Framework of Media Independent Pre-Authentication, **RFC 6252**
2. S. Krishnan, A. Dutta et al., Localized Routing for ProxyMobile IPv6, **RFC 6705**
3. Host Mobility Management Protocol, Faramak Vakil, A. Dutta, J.C Chen et al. IETF Draft, Work in Progress
4. Supporting Mobility for Multimedia with SIP, F. Vakil, A. Dutta, H. Schulzrinne
5. Supporting Service Mobility with SIP, Faramak Vakil, A. Dutta, H. Schulzrinne
6. Supporting Mobility for TCP with SIP, F. Vakil, A. Dutta, H. Schulzrinne
7. Mobility Management in a SIP Environment Requirements, Functions and Issues, F. Vakil, A. Dutta, H. Schulzrinne.
8. IDMP; An Intra-Domain Mobility Management Protocol using Mobility Agents, A. Misra, S. Das, A. Dutta et al.
9. 4 IETF drafts SIP for Appliance (SIP working group), and IDMP (Mobile IP working group)
10. V. Fajardo, A. Dutta, Y. Ohba, K. Taniuchi, H. Schulzrinne, Implementation of Media Independent Pre-Authentication, , IRTF draft
11. A. Dutta, Y. Ohba, H. Yokota, H. Schulzrinne, Requirement for Heterogeneous Handover, IRTF draft
12. A. Dutta (Ed.), MPA assisted fast-handover for PMIPv6, NETLMM draft
13. Y. Ohba, A. Dutta, S. Sreemantula, A. Yegin, M. Mani, EAP Pre-authentication Problem Statement, HOKEY working group
14. A. Dutta, S. Das, Y. Yokota. T. Chiba, H. Schulzrinne, Inter-MAG route optimization for Proxy MIPv6
15. Network Functions Virtualisation (NFV) Security: Security Management and Monitoring Specification

Trade Shows:

- Participated and demonstrated products in many of the Trade shows (PCIA, COMDEX, AFCEA, IMSAA, SARNOFF) representing Telcordia/Toshiba/KDDI and demonstrated products
- Lead role in MWIF's Proof-of-Concept demo for 4G in ITSUMO test-bed for September 2002
- LTE Americas, Dallas 2010, 2011 representing NIKSUN
- LTE World, Barcelona 2012, representing NIKSUN

Technical Reports:

1. GAP Analysis for 3GPP/3GPP2 IMS/MMD Architecture – A.Dutta, S. Das, F.J. Lin
2. Security Optimization and P-CSCF Fast-handoff for IMS/MMD Architecture – A. Dutta, A. Ghosh, S.Das, J. Lee, F.J Lin
3. Feasibility Analysis of IPv6 Transition for Ad Hoc Networks – S. Das, A. Dutta, S. Khurana, P.Gurung, H. Tanna
4. IP/SONET vs. IP/ATM/SONET for High-Speed Data Transport - A. Dutta, Tao Zhang, Joel Gannett
5. Session Control Protocol Attributes for Flexible Multimedia Support and Transport Independence - S. Mohan, Tom Chapuran, A. Dutta.
6. Paths for Industry Convergence on Session Management – A. Dutta, S. Mohan, Tom Chapuran,
7. CPE Evolution and Distributed Service Intelligence – S. Mohan, Stuart Wagner, A. Dutta et al.
8. Scalable Multicast Routing – Tony Mcauley, A. Dutta, Rajesh Talpade, Deborah Bakin
9. Evolutionary Approaches to Implementing Session Control in Emerging Broadband Networks – S. Mohan, A. Dutta, Stu Wagner, Tom Chapuran
10. Industry Progress towards Multi-service session control protocol, A. Dutta, S. Mohan
11. Communications Service Evolution and Evaluation of Access Network Alternatives for the 10X Network Era – A. Dutta, Teshima Shigeru, Stu Wagner
12. Business-Driven Evolution from Multiplatform to Multiservice Networks – A. Dutta, Vegard Masdal, Stu Wagner
13. Capacity Planning for IP/SONET, IP/ATM/SONET and DPT architecture, A. Dutta, Tao Zhang