MANAS KHATUA

CONTACT INFORMATION

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RESEARCH INTEREST

One of the highly demanding research areas which I would like to explore in future is **Mobile Cloud Networking** (MCN). MCN is Mobile Network plus Decentralized Computing plus Smart Storage offered as One Service: On-Demand, Elastic and Pay-As-You-Go. It has emerged as a promising direction for cost-efficient and reliable service delivery across data communication networks. Access to cloud storage and computing service via wireless/mobile networks should be secured and optimized in terms of delay, bandwidth, and energy consumption from an end user perspective. The integration of protocol and application/service processing allows several opportunities to optimize performance of cloud applications and services observed by the mobile user, whose device is connected to the cloud via wireless access networks. In brief, few topics of interest of research on MCN include designing suitable protocols and wireless network technologies for mobile cloud applications, optimized resource and service provisioning in mobile cloud environment, accounting and charging dynamic pricing for mobile cloud services, cloud networking for Big Data applications, and many more.

Few other areas: **Smart-Grid**, **Wireless LAN**, **Wireless Sensor Network**.

PH.D. RESEARCH WORKS

My Ph.D. research areas are in **Wireless Networks**, specifically **Wireless LANs** and **Wireless Sensor Networks**. My present work focuses on analyzing the performance of collision avoidance schemes in wireless networks, and exploiting PHY/MAC layer capabilities for managing both the intentional and unintentional collisions in the networks. In these works, I am investigating how the MAC layer issues, such as *idle channel*, *contention*, *collision*, and *delay* overheads, can be efficiently addressed using PHY/MAC layer information.

EDUCATION

Indian Institute of Technology Kharagpur, India

Ph.D. (Pursuing)

- Proposed Thesis Topic: *Analysis of Collisions in Wireless Networks*
- Adviser: Dr. Sudip Misra
- Area of Study: Wireless Networks
- Marks: 9("A" Grade)/10

Bengal Engineering and Science University, Shibpur, India

M. Tech., Information Technology, 2007

- Thesis Topic: *GSPIN: Gradient-based Sensor Protocol for Information via Negotiation in Wireless Sensor Network*
- Advisers: Dr. Indrajit Banerjee
- Area of Study: Wireless Sensor Network
- Marks: 9.2/10

University of Kalyani

B. Tech., Computer Science & Engineering, 2003

- College: RCC Institute of Information Technology, Kolkata.
- Project Topic: *Design and Implementation of an Inventory Control System*
- Advisers: A. K. Chandra, Systems Manager, & Head, Edu. & Trg. Division, Regional Computer Centre, Kolkata
- Marks: 75.06%

West Bengal Council of Higher Secondary Education

Class-XII, Pure Science, 1998

- School: Narayangarh R. R. C. L. U. S. Niketan, Narayangarh, Paschim Medinipur.
- Marks: 74.40%

West Bengal Board of Secondary Education

Class-X, 1996

- School: Narayangarh R. R. C. L. U. S. Niketan, Narayangarh, Paschim Medinipur.
- Marks: 77.77%

Journal Publications

S. Misra and **M. Khatua**
Semi-Distributed Backoff: Collision-Aware Migration from Random to Deterministic Backoff
IEEE Transactions on Mobile Computing 2014, (*Accepted: July 2014*), Manuscript ID: TMC-2013-10-0505.R1.

M. Khatua and S. Misra
CURD: Controllable Reactive Jamming Detection in Underwater Sensor Networks
Pervasive and Mobile Computing 2014, (*Accepted*, DOI: http://dx.doi.org/10.1016/j.pmcj.2014.03.007).

S. Misra, S. Mishra, and **M. Khatua**
Social Sensing-based Duty Cycle Management for Monitoring Rare Events in Wireless Sensor Networks
IET Wireless Sensor Systems 2014, (*Accepted*, Manuscript ID. WSS-2013-0125.R).

S. Misra, S. Das, **M. Khatua** and M. S. Obaidat
QoS-Guaranteed Bandwidth Shifting and Redistribution in Mobile Cloud Environment
IEEE Transactions on Cloud Computing 2013, (*Accepted*, DOI: 10.1109/TCC.2013.19).

S. Misra, S. Singh, **M. Khatua** and M. S. Obaidat
Extracting Mobility Pattern from Target Trajectory in Wireless Sensor Networks
International Journal of Communication Systems 2013, (*Accepted*, DOI: 10.1002/dac.2649).

T. Ojha, **M. Khatua** and S. Misra
Tic-Tac-Toe-Arch: A Self-organizing Virtual Architecture for Underwater Sensor Networks
IET Wireless Sensor Systems, Vol. 3, No. 4, pp. 307-316, 2013.

S. Misra, S. Dash, **M. Khatua**, A. V. Vasilakos and M. S. Obaidat
Jamming in Underwater Sensor Networks: Detection and Mitigation.
IET Communications 2012, Vol 6, No. 14, pp. 2178-2188.

M. Khatua and S. Misra
BackFreez: Probabilistic Freezing of Contention Window for Enhanced QoS Provisioning in IEEE 802.11e Wireless LANs
IEEE Transactions on Mobile Computing 2014, (*Major Revision*).

S. Misra and **M. Khatua**
Packet-Centric Trade-off and Unfair Success Region in IEEE 802.11 WLANs
IEEE Transactions on Computers 2014, (*Submitted*).

S. Das, **M. Khatua**, and S. Misra
Cheating-Resilient Bandwidth Distribution in Mobile Cloud Computing
IEEE Transactions on Dependable and Secure Computing 2014, (*Submitted*).

Conference Publications

M. Khatua and S. Misra
Exploiting Partial-Packet Information for Reactive Jamming Detection: Studies in UWSN Environment.
In: ***Proceedings of the*** 14^{th} ***International Conference on Distributed Computing and Networking***,TIFR, Mumbai, January 3-6, 2013.

S. Das, S. Misra, **M. Khatua** and Joel J. P. C. Rodrigues
Mapping of Sensor Nodes with Servers in a Mobile Health-Cloud Environment
In: ***Proc. of the*** 15^{th} ***International Conference on E-Health Networking, Application and Services***, Lisbon, October 9-12, 2013, pp. 481-485.

S. Misra, A. Mondal, S. Banik, **M. Khatua**, S. Bera and M. S. Obaidat
Residential Energy Management in Smart Grid: A Markov Decision Process-Based Approach.
In: ***Proceedings of the IEEE International Conference on Internet of Things***, Beijing, August 20-23, 2013, pp. 1152-1157.

Other Publications

M. Khatua and S. Misra
Realizing Virtual MIMO through Opportunistic Parallelism for Increasing Revenue in Enterprise Wireless Local Area Networks.
In: ***The Second IDRBT Doctoral Colloquium***, IDRBT, Hyderabad, December 20-21, 2012.

Book Chapters

S. Misra and **M. Khatua**
Cross-Layer Techniques and Applications in Wireless Sensor Networks.
In: *H. F. Rashvand and Y. S. Kavian (Eds.), Using Cross-Layer Techniques for Communication Systems.* pp. 94-119, 2012, USA, IGI Global.

Presentation and Talks

- Delivered guest lecture on "**Recent Research Trends in Wireless Sensor Networks**" in "Seminar on Computing and Informatics", organized by St. Thomas' College of Engineering and Technology, Kolkata, June 2013.

Professional Affiliations

- IEEE Student Member
- ACM Student Member
- Secretary of *Narayangarh Vivekananda Yuva Mahamandal*, an affiliated unit of Akhil Bharat Vivekananda Yuva Mahamandal

Awards

National Internet Exchange of India

- National Scholarship at Ph.D. level for one year, 2014-15.

Teaching Experience

Indian Institute of Technology Kharagpur, India

Teaching Assistant, School of Information Technology

- Wireless Ad-Hoc & Sensor Networks, Autumn Semester 2012.
- Information System Design Laboratory, Autumn Semester 2011.

Dr. B. C. Roy Engineering College, Durgapur, India

Sr. Lecturer, Department of Computer Science & Engineering,
1^{st} January, 2008 to 5^{th} February, 2008.

Bankura Unnayani Institute of Engineering, Bankura, India

Lecturer, Department of Computer Science & Engineering,
22^{nd} November, 2005 to 31^{st} December, 2007.

Research Experience

Sponsored Research and Industrial Consultancy, IIT Kharagpur, India

Senior Research Fellow
26^{th} May, 2010 to 30^{th} June, 2013.

- Project: Towards Robust Efficient and Secure Data Acquisition in Underwater Sensor Networks.

- Sponsor: Department of Information Technology, Government of India.
- Type of Research:
  Development of schemes in UWSNs for a) Delay Tolerant Routing, b) Fault Tolerant Routing, c) Jamming Detection, and d) Robust Architecture.
  Underwater Sensor Network simulator desing using MATLAB.
  Underwater Sensor Network simulator desing using NS-3.

Professional Experience

TATA Consultancy Services, India

Assistant System Engineer, Banking & Financial Services
6^{th} February, 2008 to 25^{th} June, 2010.

- Provided the core Insurance Solution using TCS BαNCS Insurance.
  - Client: DLF Pramerica Life Insurance Company Limited, India.
    Duration: April, 2009 to June, 2010.
  - Client: Skandia-BSAM Life Insurance Company Limited, China.
    Duration: June, 2008 to March, 2009.
  - Role: Insurance Management System Developer.

Reference

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Associate Professor, School of Information Technology,
Indian Institute of Technology Kharagpur,
Kharagpur, West Bengal, India, 721302.

Dr. Indrajit Banerjee
(E-mail: ibanerjee@it.becs.ac.in, Phone: +91-33-26686151)
Assistant Professor, Department of Information Technology,
Bengal Engineering and Science University, Shibpur
Botanic Garden, Howrah, West Bengal, India, 711103.

Mr. Sumit Goswami
(E-mail: sumit@hqr.drdo.in, Phone: +91-11-23007424)
Additional Director, Dte of MIST,
Defence Research and Development Organisation (DRDO) H.Q.,
Rajaji Marg, New Delhi, India, 110011.

Dated

July 22, 2014