Arani Bhattacharya

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Research Interests

I am interested in designing algorithms, protocols and systems to improve the performance of wireless networks, mobile applications and the Internet of Things (IoT).

Education

- **Stony Brook University** — Incheon, Korea & Stony Brook, NY, USA
  Ph.D. Computer Science — *2013 - 2016 (SUNY Korea) & 2016 onwards (Main Campus)*
  - Research Topic: Efficient Utilization of Spectrum
  - Advisor: Samir R. Das
  - Awarded research fellowship by Republic of Korea for three years
  - Awarded teaching assistantship in main campus for one year
- **Indian Statistical Institute** — Kolkata, India
  M. Tech Computer Science — *2011 - 2013*
  - Thesis: Power-Aware Decoding of H.264 Videos on Multicore Systems
  - Advisors: Ansuman Banerjee, Susmita Sur-Kolay
  - Graduated with First Class with Distinction
- **West Bengal University of Technology** — Kolkata, India
  B. Tech Computer Science — *2007 - 2011*

Professional Experience

- **Computer Science Department, Stony Brook University** — Incheon, Korea & New York, USA
  Doctoral Advisor: Samir R. Das — *2013 onwards*
  - **Detection of Spectrum Violations:** With spectrum becoming a scarce commodity, it has become important to ensure that it is not used without a proper license. Thus, regulatory authorities need to protect the licensed spectrum from potential violations. One way of detecting such violation is crowdsourcing the task of sensing across heterogeneous sensors available with users. I am designing techniques to draw conclusions about the presence and location of spectrum violators by adding up the data coming from multiple heterogeneous sensors.
  - **End-user Measurement of Video Quality:** Media sticks are becoming increasingly popular to view videos on televisions. However, there is no known way of measuring the quality of experience provided by different media sticks. I worked on understanding the differences in adaptation techniques and response to different network conditions by different media sticks.
  - **Computation Offloading from Resource-Constrained Devices:** In lossy networks, the performance of offloading can vary widely. I designed an algorithm that provides theoretical guarantees on offloading performance in the presence of channel loss. I also proposed and evaluated a polynomial-time dynamic programming based algorithm to provide the lowest possible execution time.
- **Computation Science Department, Stony Brook University** — New York, USA
  Teaching Assistant — *2016-2017*
  Worked as Teaching Assistant for the courses Graduate Operating Systems and Scripting Languages. The work involved grading answer scripts, and provide remedial lessons to students.

- **Samsung Research America** Mountain View, USA
  Research Intern *Summer 2017*
  Worked on understanding the working of Z-Wave protocol for home automation and identified latency as a major problem for users. I also proposed a technique of balancing latency and consistency in a smart home programming framework.

- **Formal Verification Lab, Indian Statistical Institute** Kolkata, India
  Masters Advisor: Ansuman Banerjee & Susmita Sur-Kolay *2011-2013*
  Video decoding forms an important workload of mobile devices, which have limited capacity of battery. I looked at improving the energy efficiency of video decoder while limiting the degradation in its quality.

- **Texas Instruments** Bangalore, India
  Collaborators: Bhaskar J. Karmakar, Prasenjit Basu *Summer 2012*
  Although multi-core processors are widely available, few video decoders actually utilize more than a single core to decode video. We proposed an algorithm that improves scalability and leads to much faster decoding of videos.

Publications (available at www.cs.stonybrook.edu/∼arbhattachar/publications.html)

1. Ayon Chakraborty, **Arani Bhattacharya**, Snigdha Kamal, Samir R. Das, Himanshu Gupta, Petar M. Djuric, *Spectrum Patrolling with Crowdsourced Spectrum Sensors,* IEEE Infocom 2018, Honululu, USA
2. **Arani Bhattacharya**, Ansuman Banerjee, Pradipta De, *Scheduling with Task Duplication for Application Offloading,* IEEE Consumer Communications & Networking Conference (CCNC) 2017, Las Vegas, USA
3. **Arani Bhattacharya**, Ansuman Banerjee, Pradipta De, *Service Level Guarantee for Mobile Application Offloading in Presence of Wireless Channel Errors,* IEEE Global Telecommunications Conference (Globecom) 2016, Washington DC, USA
4. **Arani Bhattacharya**, Pradipta De, *A Survey of Adaptive Techniques in Computation Offloading,* Elsevier Journal of Network and Computer Applications, Volume 78, 15 January 2017, Pages 97-115
5. **Arani Bhattacharya**, Pradipta De, *Computation Offloading from Mobile Devices: Can Edge Devices Perform Better Than the Cloud?,* ARMS-CC, Held in Conjunction with PODC 2016, Chicago, USA
6. **Arani Bhattacharya**, Ansuman Banerjee, Pradipta De, *Parametric Analysis of Mobile Cloud Computing Frameworks using Simulation Modeling,* ARMS-CC, Held in Conjunction with PODC 2015, Donostia-San Sebastin, Spain

Awards

- Research Fellowship, Government of Republic of Korea (2013-2016)
- Full scholarship, Indian Statistical Institute (2011-2013)
- Conference travel grant for IEEE/ACM ISCA 2016, ACM CoNEXT 2016
- University travel grant for IEEE AINA 2015, ACM Sensys 2015, IEEE Globecom 2016, IEEE CCNC 2017

Additional Personal Details

- **Country of Origin**: India
- **Country of Residence**: United States
- **SIGMOBILE Membership Number**: 0697801