

Mohit Agarwal

About

PhD Student at Georgia Tech

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Research Interests

[Brain-Computer Interfaces](#)
[Machine/Deep Learning](#)
[Signal Processing](#)
[Reinforcement Learning](#)
[Ubiquitous Computing](#)
[Wireless Communication](#)

Selected Coursework

Computer Science
 Machine Learning
 Deep Learning
 Artificial Intelligence
 Computation and Brain
 Information Visualization
 Applied Cryptography
 Mobile Computing
 Data Structure & Algorithms

Mathematics

Probability and Statistics
 Linear Algebra
 Convex Optimization

Signal Processing/Telecom

Information & Coding Theory
 Random Processes
 Digital Signal Processing
 Statistical Signal Processing
 Digital Communications
 Communication Networks
 Wireless Communications

Technical Skills

Programming Languages

• C/C++ • Java • Python
 • MATLAB • R

Web: • HTML • CSS • d3 • JS

Deep Learning Frameworks

• Tensorflow • PyTorch

Network Simulation Tools

• ns2 • NetLogo • iPerf

Others

• Android App Development

Education

Georgia Institute of Technology

MS/PhD in Electrical and Computer Engineering | **GPA: 4.0/4.0**

Aug'14 - Present (USA)

Advisor: Prof. Raghupathy Sivakumar | Expected Graduation: Dec 2019

Indian Institute of Technology Kanpur

Bachelors in Electrical Engineering | **GPA: 8.7/10.0**

July'10 - May'14 (India)

Internships

Apple | [Wireless Technologies](#)

Summer'18 (USA)

RAT Simulator: Worked on the development of a system-level discrete event simulator (in C++) to characterize and optimize a radio-access technology (RAT) [undisclosed, and developed in-house]

Lawrence Livermore National Labs | [Machine Learning](#)

Summer'17 (USA)

High Dimensional Spectral Sampling Methods: Automated pair-correlation function estimation for arbitrary point clouds (traditionally requires manual tuning or multiple days of MD simulation)

Cisco | [Deep Learning](#)

Summer'16 (USA)

Video Action Classification using Deep Stateful Networks: Designed deep neural nets using LSTMs in Tensorflow for action recognition in videos | Evaluated on UCF-101 dataset against stateless models

Syracuse University | [Wireless Communication](#)

Summer'13 (USA)

Automatic Modulation Classification in WSNs: Developed algorithm for automatic identification of digital modulation in wireless communication in the presence of noisy environment using Bayesian model

Selected Research Projects

Multi-Human Assisted Learning for Machine Agents using EEG

Aug'18 - Present

| [Brain-Computer Interfaces and Reinforcement Learning](#) [Doctoral Research Work]

- Research, design and develop an interesting solution paradigm allowing humans to assist ML algorithms without burdening human-in-the-loop through EEG-based brain waves
- Demonstration of the impact of our approach (including multi-human and multi-agent) in improving state-of-the-art RL algorithms by evaluating on Atari 2600 benchmark

Democratizing Brain-Computer Communication

Aug'16 - Present

| [Brain-Computer Interfaces and Deep Learning](#) [Doctoral Research Work]

- Building an automatic learning framework that application developers can leverage to build BCI applications effectively without any explicit knowledge in many related domains
- Framework learns the statistical pattern of brain waves and their correlation with mental thoughts using Deep-Neural Networks and hybrid HMM models for sequence detection

Selected Awards

- **Semi-Finalist** of Qualcomm Innovation Fellowship 2018, USA
- Ranked **2nd** in worldwide Melanoma Detection Challenge (2016) organized by ISBI
- Recipient of **MCM Scholarship** for continued excellent academic performance (2010-2014)
- Ranked in the **Top 0.1%** (amongst 475,000 students) in IIT-JEE 2010

Selected Publications/Patents

Mohit Agarwal and Raghupathy Sivakumar. "Don't charge for a day: Low-Power Wakeup Command Detection for always-on BCI Wearables" under review, ACM CHI 2019

Mohit Agarwal and Raghupathy Sivakumar. *Cogito Ergo Sum*: Using Brain Waves to Perform Personalization based on What Users Think. US Provisional Patent Application 62/565349. 2017

Mohit Agarwal and Raghupathy Sivakumar, "THINK: Toward Practical General-Purpose Brain-Computer Communication", HotWireless, ACM MobiCom, 2015

Atul Kumar Sinha, **Mohit Agarwal** and Ajit K. Chaturvedi, "Multi-Level SINR Thresholding for Reduced Complexity MIMO Detection" in National Conference on Communications, 2013