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Aug'14 - Present

Advisor: Prof. Raghupathy Sivakumar

GPA: 4.0/4.0 (Expected Graduation: Fall 2020)

July'10 - May'14

GPA: 8.7/10.0

Brain-Computer Interfaces, Human-In-The-Loop Reinforcement Learning, Ubiquitous Computing
Applications in Machine Learning, Deep Learning and Signal Processing

Mohit Agarwal, Duo Xu, Faramarz Fekri and Raghupathy Sivakumar, “Accelerating Reinforcement Learning Agent with EEG-based Implicit Human Feedback”, IEEE Transactions on Systems, Man, and Cybernetics: Systems (under submission)

- **Semi-Finalist** of Qualcomm Innovation Fellowship 2018, USA
- Ranked **2nd** in worldwide Melanoma Detection Challenge (2016) organized by ISBI
- Ranked in the **Top 0.1%** (amongst 475,000 students) in IIT-JEE 2010
- Selected in the **Top 1%** (amongst 40,000 students) in National Physics Olympiad 2010

Python, C/C++, Java, MATLAB/R, Android Development, Web (HTML/CSS/d3.js), L^AT_EX
Deep Learning Frameworks: **Tensorflow**, Caffe, Torch and Keras

Internships	Apple, USA - Wireless Technologies Group Summer'18 <i>Wireless Software Development</i> , Mentors: Firouz Behnamfar and Velu Elangovan <ul style="list-style-type: none"> Developed a system-level discrete event simulator in C++ to characterize and optimized the parameters of a radio-access technology (undisclosed, and developed in-house)
	Lawrence Livermore National Laboratory - CASC Summer'17 <i>Machine Learning Research</i> , Mentor: J. J. Thiagarajan <ul style="list-style-type: none"> Automated the Pair-Correlation Function (PCF) estimation for arbitrary point clouds (which traditionally either require manual tuning for estimation, or takes several days for MD simulation)
	Cisco Systems, Inc. USA Summer'16 <i>Deep Learning Research</i> , Mentors: Rob Liston and Dan Tan <ul style="list-style-type: none"> Designed DNNs using LSTMs in Tensorflow, for action recognition in video clips using UCF-101 The proposed stateful model performed with more than 25% accuracy over stateless model
	Syracuse University, USA - Sensor Fusion Lab Summer'13 <i>Wireless Communication Research</i> Mentor: Prof. Pramod Varshney <ul style="list-style-type: none"> Developed algorithm for automatic identification of digital modulation in wireless communication in the presence of noisy environment having unknown channel parameters using Bayesian model Proposed <i>Collapsed Gibbs sampling</i> based approach for channel parameter estimation Performs with more than 90% correct classification probability for higher-order QAMs
Research Experience	Multi-Human Assisted Learning for Machine Agents using EEG Aug'18 - Present <i>BCI Research Project, Reinforcement Learning (Doctoral Thesis: Prof. Sivakumar and Prof. Fekri)</i> <ul style="list-style-type: none"> Research, design and develop an interesting solution paradigm allowing humans to assist RL algorithms without burdening human-in-the-loop through EEG-based brain waves Demonstration of the impact of our approach in improving state-of-the-art RL algorithms (e.g., DQN) by developing multiple Atari-like discrete-grid based games in OpenAI Gym Experimentally showed that error-potentials can be learned in a zero-shot manner (with AUC ≥ 0.8), and achieves a training acceleration of 2.25x while making 75.56% less queries
	Low-Power Command Detection for BCI Wearables Aug'16 - Aug'18 <i>BCI Research Project, Ubiquitous Computing, Deep Learning (Doctoral Thesis: Prof. Sivakumar)</i> <ul style="list-style-type: none"> Proposed a wakeup command detection design and detection strategy enabling always-on BCI wearables to run on low-power mode achieving 2.7x improvement in battery life Proposed BLINK, an algorithm to self-learn and detect eye-blinks in user brainwaves with 98% accuracy and low false-positive rate without requiring any user-training
	THINK: Turning Thoughts into Action Jan'15 - July'15 <i>BCI Research Project under Prof. Sivakumar as a part of Master's Thesis</i> <ul style="list-style-type: none"> Developed THINK, a general purpose platform to communicate by mere imagination Explored signal processing and detection of <i>mu-waves</i>, specifically in non-invasive domain (EEG) Achieved counter-intuitive results for system accuracy (81.2%), think rate and form-factor

Academic Projects	VisualAIDS: An Interactive visualization of HIV/AIDS data Oct'17 - Nov'17	
	<i>Information Visualization Project</i> (Information Visualization: Prof. Alex Endert)	
	<ul style="list-style-type: none"> An interactive visualization designed in d3.js to investigate and explore HIV/AIDS data for various countries over time. More information at www.agmohit.com/VisualAIDS/ 	
	Modelling the Rehearsal Effect of Humans Oct'16 - Nov'16 <i>Neuroscience and Machine Learning Project</i> (Computation and Brain: Prof. Santosh Vempala) <ul style="list-style-type: none"> Demonstrated the notion of forgetting and rehearsal in humans in the realm of neural networks Successfully simulated Ebbinghaus forgetting curve and learning curve, and explored various rehearsal properties by building a Recurrent Neural Net in Tensorflow 	
Academic Courses	Skin Lesion Analysis towards Melanoma Detection Mar'16 - Apr'16 <i>Deep Learning Project</i> (Deep Learning: Prof. Zsolt Kira) <ul style="list-style-type: none"> Automated skin cancer detection by proposing Deep Learning architectures based on CNNs for skin lesion segmentation, feature extraction and classification Won 2nd prize for the classification (81.3%) and feature extraction in ISBI 2016 Challenge 	
	General Game Playing Agent Jan'13 - Apr'13 <i>Artificial Intelligence Project</i> (Artificial Intelligence: Prof. Amitabha Bhattacharaya) <ul style="list-style-type: none"> Developed an artificial gaming agent, capable of playing any game without human intervention Selected amongst top 5 projects, to compete on a global scale in GGP competition in AAAI 	
	Computer Science	Machine learning, Deep Learning, Artificial Intelligence, Computation and Brain, Applied Cryptography, Mobile Computing, Advanced Programming Techniques, Android Application Development, Information Visualization, Data Structure and Algorithms
	Mathematics	Probability and Statistics, Linear Algebra, R Programming
Grants	Telecom/SP	Information and Coding Theory, Random Processes, Digital Communication Networks, Communication Systems, Digital Signal Processing, Statistical Signal Processing, Advanced Digital Communications, Wireless Communications and Networks, Convex Optimization in SP/COM
	NSF Award #1837369, <i>CPS: Small: Multi-Human Assisted Learning for Multi-Agent Systems using Intrinsically Generated Event-Related EEG Potentials</i> (\$500,000 PI: Prof. Sivakumar, Co-PI: Prof. Fekri, Jan'19 - Dec'21): Co-authored the winning proposal with significant technical contribution	
Professional Service	PC Member	ICWSM 2020
	Session Chair	Allerton 2019: Statistical and Signal Processing
	Reviewer	ACM CHI'20, IMWUT'20,19, CogSci'20, ACT'19, MobileHCI'19, ICWSM'20,'19, AutomotiveUI'19,, IEEE Transactions on Mobile Computing'17,'18,'19