Abhishek Bhatia

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Research Interest	My research interests lie broadly in Machine learning, Reinforcement learning & Natural language processing.	

Education

Columbia University   Jan 2017 - May 2018
New York, USA
Master of Science in Computer Science   *GPA: 3.8/4.0*

University School of Information, Communication and Technology   2011- 2015
New Delhi, India
Bachelor of Science in Information Technology   *First class with distinction*
Thesis: A Hybrid Autonomic Computing-Based Approach to Distributed Constraint Satisfaction Problems. Link

Publications

• **Bhatia, A**., Altosaar J. and Gu, S. Proximity-constrained reinforcement learning. NIPS 2017 Workshop, Advances in Approximate Bayesian Inference. Link

• Sharma, I., Chourasia, B., **Bhatia, A**. and Goyal, R., 2016. On the role of evangelism in consensus formation: a simulation approach. Complex Adaptive Systems Modeling, 4(1), p.16. Link

• **Bhatia A**, Singh A, Goyal R. A Hybrid Autonomic Computing-Based Approach to Distributed Constraint Satisfaction Problems. Computers. 2015;4(1):2-23. Link

• Singh A, Thapar S, **Bhatia A**, Singh S, Goyal R. Disk Scheduling using a Customized Discrete Firefly Algorithm. Cogent Eng. 2015;2(1):1011929. Link

• **Bhatia A**, Johari R. Genetically optimized ACO inspired PSO algorithm for DTNs. In: $3rd$ International Conference Reliability, Infocom Technologies and Optimization (ICRITO). 2014:1-6. Link

• **Bhatia A**, Singh D, Gyan Deep, P. Jangam Annie, R. Pathak Ravi and Raghuram N. Pathway and Motif Analysis of G-protein (α subunit) Regulated Genes in Rice. In: Advances in Stem Cell Research 2014, SelectBio. Link

Research Projects

Group Rating Decomposition as a Distribution over Users   Jan 2018 – May 2018
Prof. Tony Jebara   Columbia University
• We formalized a representation for groups of users as a mix- ture of user-preference archetypes.
• Subsequently, put forth a novel three step process for decom- posing group ratings into a composition of user archetypes. Report-Link

De(warp/nois)ing Images with Conditional GANs   Jan 2017 – May 2017
Prof. Peter Belhumeur   Columbia University
• Used a baseline cGAN for dewarping/denoising images, and understanding why the network blurs out high spatial frequency components. Report-Link, Presentation-Link

VideoStyle Transfer System   Jan 2017 – May 2017
Dr. Sambit Sahu   Columbia University
• The system was designed for users to convert their video to a special style they like. Users can upload a video to the server, and get an email of the link of their processed videos.
• A video stylizing processing method was implemented using CNNs. EC2, SQS, SNS, and S3 were used to make the system efficient and scalable. Report-Link, Presentation-Link

Research Work Experience

Columbia University   Research Intern, Jaan Altosaar (Prof. David Blei)
New York, NY, USA   May 2017 - Present
• Developed a generic, efficient method to make reinforcement learning algorithms more robust by constraining gradient updates of policy parameters.
• Carried out an empirical study to demonstrate that the method with an entropy proximity statistic leads to more stable learning and increased exploration using proximal policy optimization in a continuous control task.

Indian Institute of Technology(IIT), Delhi   Project Assistant, Prof. Jayadeva
New Delhi, India   Jan 2016 - Nov 2016
• Developed low complexity classification framework for EEG signals which achieved lower error rates compared to previous approaches such as SVMs.
• The proposed methodology learns simpler representations which is illustrated by the lower number of support vectors used.

Indraprastha Institute of IT (IIIT), Delhi   Research Assistant, Dr. Sachit Butail
New Delhi, India   Jun 2015 - Dec 2015
• Built a kinematic model to explain how emotional intensity and organization in human crowds affects the spread of panic. The study provided new insights into how certain psychologies are more prone to specific triggers in crowd disasters.
• Developed a dynamical model to simulate changes of perceptual vision field in human crowds. Conducted 10 experimental trials with over 200 participants by giving each individual one of the two specific instructed behaviors to exit the room.

University School of Biotechnology   Research Intern, Prof. Raghuram
New Delhi, India   Mar 2014 - Jun 2014
• Subjected the whole transcriptome microarray data from a natural knockout mutant to pathway and motif analysis. The aim was to understand genome wide role of G-protein (alpha subunit) in plants.
• The results suggested that at least 64 KEGG pathways were affected and the extensive role(s) for the only known G-protein (alpha subunit gene) in rice was confirmed.

Research Talks	• Butail, S., **Bhatia, A**., Mohammadi, E. Speed Modulated Social Influence in Evacuating Pedestrian Crowds. SIAM Conference on Dynamical Systems, 2017. Link

Teaching Experience	Teaching Assistant (ECBM 4040 Neural Networks and Deep Learning) Columbia University; Dept. of Electrical Engineering	Prof. Zoran Kostic Sept 2017- Nov 2017
	Teaching Assistant (COMS 4771 Machine Learning) Columbia University; Dept. of Computer Science	Prof. G. Creamer May 2017- July 2017

Relevant Recent Coursework	Machine Learning Natural Language Processing Analysis of Algorithms Operating Systems	Deep Learning Bayesian Machine Learning Statistical Inference Cloud Computing & Big data	Advanced Machine Learning Reinforcement Learning

Technical Skills	*Programming Languages*: Java, C++, C, R, Matlab, Python, NetLogo,. *Libraries*: Django, Flask, Twisted, TensorFlow, Keras, PyTorch, Caffe.