Abhishek Bhatia

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

Education

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

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, 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 (subunit) Regulated Genes in Rice. In: Advances in Stem Cell Research 2014, SelectBio. Link

Research Projects

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 is 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, 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 - 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 - 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 - 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) Prof. Zoran Kostic
Columbia University; Dept. of Electrical Engineering Sept 2017- Nov 2017

Teaching Assistant (COMS 4771 Machine Learning) Prof. G. Creamer
Columbia University; Dept. of Computer Science May 2017- July 2017

Recent CourseWork

Machine Learning | Deep Learning | Cloud Computing & Big data
Natural Language Processing | Analysis of Algorithms | Reinforcement Learning
Bayesian Machine Learning

Technical Skills

Languages: Java, C++, C, NetLogo, Matlab, R, Python, Shell scripting.
Libraries: Django, Flask, Twisted, TensorFlow, Keras, PyTorch, Caffe.