

Ajjen Joshi

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EDUCATION

Boston University, Boston, MA

Ph.D. student, Computer Science *expected 2018*

- Advisors: Dr. Margrit Betke and Dr. Stan Sclaroff

M.S., Computer Science 2014

- Thesis: *A Random Forest Approach to Segmenting and Classifying Gestures*
- Advisors: Dr. Margrit Betke and Dr. Stan Sclaroff
- GPA: 3.9/4.0

Connecticut College, New London, CT

B.A., Computer Science and Architectural Studies (Double Major) 2012

- Minor in Mathematics and Certificate in Arts and Technology
- Thesis: *Real-time Facial Animation by Gesture Imitation*
- Advisor: Dr. Ozgur Izmirli
- GPA: 3.96/4.0 *Summa Cum Laude*

St. Xavier's School, Kathmandu, Nepal

High School Diploma 2007

- Rank: 1/108

WORK

EXPERIENCE

Adobe Creative Technologies Lab | Cambridge, MA

Research Intern Summer 2016

- Explored a deep learning approach to automatically generate inbetween frames in 2D handdrawn animations. Advised by Masha Shugrina

Disney Research | Cambridge, MA

Research Intern Summer 2015

- Implemented prototype system for performing gesture recognition from glove sensor data and explored development of subject-specific hierarchical Bayesian classifiers. Advised by Dr. Hanspeter Pfister, Dr. Soumya Ghosh

Ballets Russes Arts Initiative | Boston, MA

Animator Spring 2015

- Created animations and interactive visual projections for an experimental rendition of "Victory Over the Sun," an iconoclastic futurist Russian opera that first premiered in 1913, directed by Anna Winestein.

Brown University | Providence, RI

Research Intern Summer 2011

- Created interactive multimedia installations in Max/MSP/Jitter using the Microsoft Kinect. Advised by Dr. Todd Winkler.

Ammerman Center for Arts and Technology | New London, CT

Animation and Motion Capture Technician Fall 2010 - Spring 2012

- Assisted and mentored students in computer animation and motion capture projects.

RESEARCH
STATEMENT

My broad research interests lie in the intersectional and interdisciplinary fields of computer vision, machine learning, and human computer interaction. Particularly, I am interested in the analysis of spatio-temporal human signals, generated for instance by eye-gaze, facial expressions and body gestures, in order to facilitate a computational understanding of various aspects of human behavior as well as enable intelligent and effective interaction with the computer.

PUBLICATIONS

- [1] Ajjen Joshi, Soumya Ghosh, Sarah Gunnery, Linda Tickle-Degnen, Margrit Betke, Stan Sclaroff. **Context-Sensitive Prediction of Facial Expressivity Using Multimodal Hierarchical Bayesian Neural Networks**. *Under Review*.
- [2] Ajjen Joshi, Soumya Ghosh, Margrit Betke, Stan Sclaroff, Hanspeter Pfister. **Personalizing Gesture Recognition Using Hierarchical Bayesian Neural Networks**. Computer Vision and Pattern Recognition (CVPR), 2017. *Poster*.
- [3] Elham Saraee, Saurabh Singh, Kathryn Hendron, Mingxin Zheng, Ajjen Joshi, Terry Ellis, Margrit Betke. **ExerciseCheck: Remote Monitoring and Evaluation Platform for Home Based Physical Therapy**. ACM International Conference on Pervasive Technologies Related to Assistive Environments (PETRA), 2017. *Oral*.
- [4] Elham Saraee, Ajjen Joshi, Margrit Betke. **A Therapeutic Robotic System for the Upper Body based on the Proficio Robotic Arm**. IEEE International Conference on Virtual Rehabilitation (ICVR), 2017. *Poster*.
- [5] Elham Saraee, Saurabh Singh, Ajjen Joshi, Margrit Betke. **PostureCheck: Posture Modeling for Exercise Assessment using the Microsoft Kinect**. IEEE International Conference on Virtual Rehabilitation (ICVR), 2017. *Poster*.
- [6] Ajjen Joshi, Soumya Ghosh, Margrit Betke, Hanspeter Pfister. **Hierarchical Bayesian Neural Networks for Personalized Classification**. Neural Information Processing Systems (NIPS) Workshop on Bayesian Deep Learning, 2016. *Poster*.
- [7] Ajjen Joshi, Linda Tickle-Degnen, Sarah Gunnery, Terry Ellis, Margrit Betke. **Predicting Active Facial Expressivity in People with Parkinson's Disease**. ACM International Conference on Pervasive Technologies Related to Assistive Environments (PETRA), 2016. *Oral*.
- [8] Ajjen Joshi, Camille Monnier, Margrit Betke, Stan Sclaroff. **Comparing Random Forest Approaches to Segmenting and Classifying Gestures**. Image and Vision Computing (IMAVIS), 2016.
- [9] Andrew Kurauchi, Wenxin Feng, Ajjen Joshi, Carlos Morimoto, Margrit Betke. **EyeSwipe: Dwell-free Text Entry Using Gaze Paths**. ACM Conference on Human Factors in Computing Systems (CHI), 2016. *Oral*.
- [10] Huy Le, Ajjen Joshi, Margrit Betke. **b3.js: A Library for Interactive Virtual Reality Web 3D Graphs**. IEEE Virtual Reality (VR), 2016. *Research Demo*.
- [11] Ajjen Joshi, Camille Monnier, Margrit Betke, Stan Sclaroff. **A Random Forest Approach to Segmenting and Classifying Gestures**. IEEE International Conference on Automatic Face and Gesture Recognition (AFGR), 2015. *Oral*.
- [12] Ajjen Joshi, Bridget Baird, Ozgur Izmirli. **Developing a Tool for Dance Motion Synthesis**. Biennial Symposium on Arts and Technology, 2012. *Oral*.

TALKS AND
PRESENTATIONS

- [1] **Analysis of Facial Expressivity in Parkinson’s Disease Patients using Hierarchical Bayesian Neural Networks.** Tufts University Health Quality of Life Lab Seminar. Medford, MA. 2017.
- [2] **Personalizing Gesture Recognition Using Hierarchical Bayesian Neural Networks.** New England Computer Vision Workshop. Boston, MA. 2016.
- [3] **Deeptween: A Data-Driven Approach to Automatic Inbetweening in Hand-drawn Animations.** Adobe Research Intern Presentation. Cambridge, MA. 2016.
- [4] **Predicting Active Facial Expressivity in People with Parkinson’s Disease.** PETRA. Corfu, Greece. 2016.
- [5] **Hierarchical Bayesian Models for Subject-specific Gesture Recognition.** Disney Research Intern Presentation. Cambridge, MA. 2015.
- [6] **Victory Over the Sun: Panel Discussion (along with Harlow Robinson, Larissa Shmailo and Anna Winestein).** Boston, MA. 2015.
- [7] **A Random Forest Approach to Segmenting and Classifying Gestures.** AFGR. Ljubljana, Slovenia. 2015.

TEACHING
EXPERIENCE

- Artificial Intelligence (Senior undergraduate course in AI) Spring 2016, 2017
Rating: 4.68/5, 4.65/5 (rated by 19 in Spring 2016 and 32 students in Spring 2017)
- Image and Video Computing (Graduate course in computer vision) Fall 2014
Rating: 4.82/5 (rated by 22 students)
- Application Programming (Introductory course in programming) Fall 2013
Rating: 4.43/5 (rated by 44 students)

MENTORING

- [1] Pratikkumar Patel, Master’s Project on **Classifying Eye-gaze Typing Patterns with LSTMs.** Fall 2017.
- [2] Rohit Agrawal, Master’s Project on **Personalized Human Motion Prediction using Recurrent Neural Networks.** Fall 2017.
- [3] Srivathsa Rajagopal, Master’s Project on **Facial Expression Analysis of US Presidential Debates.** Fall 2016.
- [4] Huy Le, Undergraduate Research Project on **Building a Library for Data Visualization in Virtual Reality.** Fall 2015.

HONORS AND
AWARDS

NSF PETRA Doctoral Consortium Award (2016), Boston University Computer Science Teaching Excellence Award (2015), Phi Beta Kappa (2012), Architectural Studies Award for Outstanding Graduating Senior (2012), Winthrop Scholar, Connecticut College’s highest academic honor (2011), Keck Research Grant (2010)

TECHNICAL SKILLS

Programming

- Java, Python, C++, Matlab, HTML/CSS, JavaScript, PHP, MySQL, Processing

Other

- **Deep Learning Libraries:** Caffe, TensorFlow, PyTorch; **Animation and Motion Capture:** Autodesk Maya, Motionbuilder; Blender; **Design:** Adobe Photoshop, Illustrator, InDesign; **Film:** Adobe Premiere, FinalCut

SERVICE AND
OUTREACH

- Reviewer/Program Committee for CVPR ‘18, AFGR ‘18 , ‘17, PSIVT ‘17, CVPRW ‘17, PETRA ‘17, ‘16, Pattern Recognition, Journal of AI Research
- AI@BU Seminar Coordinator (Fall 2016-current)