Chaitanya Ahuja

5719 Gates and Hillman Center – Carnegie Mellon University
(412) 726 2373 • cahuja@andrew.cmu.edu
www.chahuja.com • chahuja

Education

Carnegie Mellon University — **Pittsburgh**
PhD in Language Technologies, 3.69/4 — *Aug 2015 – Present*
Advisor: Dr. Louis-Philippe Morency

Indian Institute of Technology, Kanpur — **Kanpur**
B.Tech in Electrical Engineering, 9.5/10 — *Aug 2011 – May 2015*
Minor in Artificial Intelligence

Publications

Preprints

[P1] T. Baltrusaitis, **C. Ahuja**, L.-P. Morency, "Multimodal machine learning: A survey and taxonomy," *ArXiv preprint arXiv:1705.09406*, 2017. [Online]. Available: https://arxiv.org/abs/1705.09406.

Published

[P1] **C. Ahuja** and L.-P. Morency, "Lattice recurrent unit: Improving convergence and statistical efficiency for sequence modeling," *AAAI*, 2018. [Online]. Available: https://arxiv.org/abs/1710.02254.

[P2] **C. Ahuja** and R. M. Hegde, "Fast modelling of pinna spectral notches from hrtfs using linear prediction residual cepstrum," in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, IEEE, 2014, pp. 4458–4462. [Online]. Available: http://chahuja.com/files/icassp_chahuja_paper.pdf.

[P3] A. Sohni, **C. Ahuja**, R. M. Hegde, "Extraction of pinna spectral notches in the median plane of a virtual spherical microphone array," in *4th Joint Workshop on Hands-free Speech Communication and Microphone Arrays (HSCMA)*, IEEE, 2014, pp. 142–146. [Online]. Available: http://chahuja.com/files/hscma_chahuja_paper.pdf.

Arxivs

[A1] **C. Ahuja**, K. Nathwani, R. M. Hegde, "A complex matrix factorization approach to joint modeling of magnitude and phase for source separation," *ArXiv preprint arXiv:1411.6741*, 2014. [Online]. Available: https://arxiv.org/abs/1411.6741.

Research Experience

- Carnegie Mellon University, Prof. Louis-Philippe Morency — *August 2015 – Present*
  - Multimodal Representation Learning

  Learning Multimodal representations for tasks like Speech Synthesis and Video Captioning. This includes conditioning parameters (for e.g. which control emotion) of a representation to modify the synthesized speech.
- Indian Institute of Technology Kanpur, Prof. Rajesh Hegde — *Aug 2013 – May 2015*
  - Spatial Audio Analysis

  Finding relations between the structure of the ear and Head Related Transfer Functions (HRTFs)

- Indian Institute of Technology Kanpur, Prof. Vinay Namboodiri *Aug 2014 – May 2015*
  - **Final Year Project:** Visual Summarization of foreground object motion using boundary initialization of object tracking [tech. report]

Internships

- Cornell University, Prof. Tsuhan Chen *May 2014 – August 2014*
  - Prediction of Adjectives for given Nouns using Probability distribution of adjective-noun pairs and adjective-adjective similarity [tech. report]
- SURGE, Indian Institute of Technology Kanpur, Prof. Rajesh Hegde *May 2013 – August 2013*
  - On-Line modeling of the Pinna for Computation of HRTF's in Rendering 3D Audio

Selected Projects

- Deep RL and control *Jan 2017 – May 2017*
  - Segmentation Models for NLP tasks with RL [tech. report]

  Segmenting sentences into useful phrases for tasks like Machine Translation and Summarization
- Statistical Machine Learning *Jan 2017 – May 2017*
  - Topological Data Analysis [tech. report] [presentation]

  Analysing confidence intervals in cluster trees to facilitate pruning of low-confidence branches (or leaves)
- Multimodal Machine Learning *Aug 2015 – May 2016*
  - Video Captioning [tech. report]

  Generating descriptive captions for movie video segments.

Skills

- Languages: Bash, C, CSS, HTML, LaTeX, Make, Python
- Frameworks: Numpy, Pandas, Pytorch, Scipy, Scikitlearn, Tensorflow, Theano
- OS: Linus, OSX

Scholastic Achievements

- Awarded **Summer Undergraduate Research Grant for Excellence** (SURGE) 2013, granted by *Dean, Resource Planning and Generation, IIT Kanpur*
- Judged as one of the top 7 projects (out of 70) **in SURGE 2013**
- Received **Academic Excellence Award** for distinctive performance in terms 2011-12, 2012-13.
- Secured **All India Rank 231** - **Top 0.05%** (amongst 4,75,000 students) in IIT-JEE 2011.
- Secured **All India Rank 124** - **Top 0.05%** (amongst 10,00,000 students) in AIEEE 2011.

Teaching Experience

- Advance Multimodal Machine Learning (CMU 11-777), TA *Spring 2017*

Graduate Course-work

- Deep Reinforcement Learning (CMU 10-703): R. Salakhutdinov, K. Fragkiadaki *Spring 2017*
- Statistical Machine Learning (CMU 10-702): L. Wasserman, R. Tibshirani *Spring 2017*
- Deep Learning (CMU 10-707): R. Salakhutdinov *Fall 2016*
- Intermediate Statistics (CMU 10-705): L. Wasserman *Fall 2016*

- Advance Multimodal Machine Learning (CMU 11-777): L.-P. Morency *Spring 2016*
- Machine Learning (CMU 10-701): T. Mitchell *Spring 2016*
- Human Communication and Multimodal ML (CMU 11-776): L.-P. Morency *Fall 2015*
- Algorithms for NLP (CMU 10-702): C. Dyer *Fall 2015*