HARISH HARESAMUDRAM

harkash.github.io ◇ hharesamudram3@gatech.edu ◇ linkedin.com/in/hharesamudram

EDUCATION

Georgia Institute of Technology, Atlanta, GA *Aug. 2019 -*
PhD in Electrical and Computer Engineering GPA – 3.77/4
Research area: Unsupervised representation learning for human activity recognition
Advised by Prof. Thomas Ploetz and Prof. Irfan Essa

Georgia Institute of Technology, Atlanta, GA *Aug. 2017 - May 2019*
Master of Science in Electrical and Computer Engineering GPA – 3.75/4
Master's thesis advised by Prof. Thomas Ploetz and Prof. David Anderson

PES Institute of Technology, Bangalore, India *Sep. 2011 - June 2015*
Bachelor of Engineering in Electrical and Electronics Engineering GPA – 8.95/10

PUBLICATIONS

[1] Harish Haresamudram et al. Contrastive predictive coding for human activity recognition. *Under review.*

[2] Harish Haresamudram et al. Masked reconstruction based self-supervision for human activity recognition. In *Proceedings of the 2020 International Symposium on Wearable Computers*, ISWC '20, page 45–49, New York, NY, USA, 2020. Association for Computing Machinery.

[3] Hyeokhyen Kwon et al. Imutube: Automatic extraction of virtual on-body accelerometry from video for human activity recognition. *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.*, 4(3), September 2020.

[4] Harish Haresamudram et al. On the role of features in human activity recognition. In *Proceedings of the 23rd International Symposium on Wearable Computers*, ISWC '19, New York, NY, USA, 2019. ACM.

[5] Nagendra Kumar et al. Iitg-indigo system for nist 2016 sre challenge. *Proc. Interspeech 2017*, 2017.

[6] BK Dhanush et al. Factor analysis methods for joint speaker verification and spoof detection. In *Acoustics, Speech and Signal Processing (ICASSP), 2017 IEEE International Conference on*, pages 5385–5389, 2017.

WORK EXPERIENCE & INTERNSHIPS

Georgia Institute of Technology Aug 2018 -
Graduate Teaching Assistant

· Graduate Teaching Assistant for the online graduate Computer Vision course.
· Responsibilities: grading assignments and projects, holding office hours and moderating discussions on Piazza.

Asurion May 2019 - Aug 2019
Data Science Intern

· Worked on a photography service to rank user photos for suggesting best photos for printing (into frames and photobooks).
· Implemented deep learning-based photo quality assessment (based on the Neural Image Assessment (NIMA) paper by Google) and memorability prediction models.
· Tools: PyTorch, scikit-learn.

Asurion May 2018 - Aug 2018
Data Science Intern

· Worked with chat messaging data between users and customer support.
· Clustered sentence level embeddings for the identification of a distinct, concise list of questions asked by customers, for use in an autocomplete feature.
· Tools: Tensorflow, Keras, scikit-learn.

LEAP Labs, Indian Institute of Science Aug 2016 - July 2017
Project Assistant

· Developed speaker recognition, spoof detection and spoken language identification systems.
· Approaches included speech-based machine learning (such as i-vectors and joint factor analysis (JFA)) and deep learning (including autoencoders and recurrent networks).
· Participated in NIST Speaker Recognition Evaluation 2016 (SRE16) & ASVspoof 2017 challenges.
· Methods & tools: ivectors (Microsoft Identity Toolkit, MATLAB), deep neural networks (Keras, Python), Kaldi.

GRADUATE COURSEWORK

- Mathematical Foundations of Machine Learning
- Digital Image Processing
- Statistical Techniques for Robotics
- Random Processes
- Vision and Language
- Probabilistic Graphical Models
- PDEs for Image Processing and Vision
- ML with Limited Supervision

ACADEMIC PROJECTS

Contrastive learning for activity recognition Jul 2020 -
Studying approaches based on contrastive learning for sensor data from wearables

· Applying contrastive learning for unsupervised pre-training on wearable sensor data.
· Evaluating the weights learned for downstream tasks including activity recognition and clustering.
· Tools: PyTorch, scikit-learn.

Masked reconstruction based self-supervision for activity recognition Aug 2019 - Jul 2020
Developing BERT-like self-supervision to learn representations for continuous-valued time-series sensor data from wearables

· Reconstructing masked portions of data from body worn sensors to learn temporal context.
· Evaluating the performance of representations, and transfer capabilities of the learned weights to a fully supervised network.
· Tools: PyTorch, scikit-learn.

The role of features in human activity recognition Aug 2018 - May 2019
Understanding the role of various feature representations for human activity recognition using wearables *Master's thesis*

· Contrasted unsupervised representations from autoencoders against statistical, distribution-based, and supervised representations for their performance on a common backend classifier.
· Evaluated the representations from a wearable computing perspective – considering factors such as the memory footprint, number of trainable parameters, dimensionality of the representations etc.
· Advised by Prof. Thomas Ploetz and Prof. David Anderson.
· Tools: PyTorch, scikit-learn.

Classification of acoustic scenes Jan 2018 - Nov 2018
Classifying audio clips into acoustic scenes such as cafe, car, train etc

· Studied the effect of auxiliary losses in convolutional neural networks for audio scene classification.
· Tools: Keras, PyTorch, scikit-learn.

im2LaTeX Jan 2018 - May 2018
Generating the LaTeX markup of formulae from image inputs *Course project*

· Studied the efficacy of variational autoencoders for generating the LaTeX markup of the formula from the image.
· Tools: Tensorflow, Keras.

SKILLS & INTERESTS

- Programming Languages - Python, MATLAB.
- Deep learning frameworks - PyTorch, Keras.
- Interests - reading books (fantasy and non-fiction), climbing (bouldering).