Nauman Ahad

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https://nahad3.github.io

OVERVIEW

PhD. student with extensive experience in using machine learning to help solve real world problems. Prior projects have provided me the opportunity to work with real world datasets that arise in computer vision, time series and recommender system problems. My research concentration is in time series, particularly in problems that are related to anomaly and change detection. I am particularly interested in opportunities that involve applying and devising machine learning tools for real-world noisy data.

EDUCATION

Georgia Institute of Technology Aug 2018 - Present
PhD in Electrical and Computer Engineering
Specialization in Signal Processing and Machine Learning

Georgia Institute of Technology Aug 2016 - May 2018
Masters in Electrical and Computer Engineering

National University of Sciences and Technology Sep 2010 - Aug 2014
Bachelors in Electrical Engineering

WORK EXPERIENCE

Georgia Institute of Technology

Graduate Research Assistant Aug 2018 - Present

- Developed an in-seat wheelchair activity tracker utilizing SVMs, LSTMs and Temporal CNNs. This tracker is intended to be a device similar to a Fitbit for wheelchair users, and is deployed in clinical trials
- Developed robust and interpretable change point detection and sequence classification methods for time series/ sensor data. These methods improve performance in real world high dimensional settings with missing data.

NEC Research Labs America

Research Intern May 2021 - Aug 2021

- Proposed new methods for data efficient ordinal classification using self-supervised learning. These methods reduce training time by 60 % for certain deep learning systems
- Explored how soft-labels are better suited for classifying noisy ordinal data
- Incorporated these models for Signal to Noise ratio classification in real world optical network systems
- This work resulted in a Patent application

xFlow Research

Software Engineer Sep 2014 – June 2016

- Delivered an automated hardware benchmarking suite for quantifying NFV infrastructure performance as part of the OPNFV project (open source project under Linux foundation)

COURSE PROJECTS

- Using BCG signals to identify heart compensated states using Probabilistic Graphical Models
- Change detection through Online Convex Programming
- Image generation using a provided caption through Generative Adversarial Networks
- Network community detection using Non-negative Matrix Factorization
- Collaborative Filtering for Recommender Systems using $K-1$, 1 bit Matrix Completion

SKILLS

Programming: Python, MATLAB, C/C++
Tools/Frameworks: Pytorch, TensorFlow, Bash, Ansible, Sci-kit learn, Git, Jenkins, Linux, LaTeX

PUBLICATIONS

- N. Ahad, M. Davenport, " Semi-supervised Sequence Classification through Change Point Detection ", *In Proc. Conference of Advance. of Artif. Intell. (AAAI)*, 2021
- F. Zhu,A. Sedler, H. Grier, N. Ahad, M. Davenport, M. Kaufman,A. Giovannucci, C.Pandarinath " Deep inference of latent dynamics with spatio-temporal super-resolution using selective backpropagation through time ", *In Proc. Neur. Info. Process. Systems (NeurIPS)*, 2021
- N.Ahad, S. Sonenbum, M. Davenport, S. Sprigle, " Validating a Wheelchair In-Seat Activity Tracker", *Assistive Technology*, 2021.
- N. Ahad, E. Dyer, K. Hengen, Y. Xie, M. Davenport, "Learning Sinkhorn divergences for supervised change point detection", *Preprint*, 2022.
- N.Ahad, Y. Xie, M. Davenport, " Data Adaptive Symmetrical CUSUM ", under review in *Sequential Analysis*
- A.D. McRae, A. Xu, J. Jin, N.Nadagouda, N. Ahad, P. Guan, S. Karnik, M. Davenport" Delta distancing: A Lifting Approach to localizing items from user comparisons", *In Proc. IEEE Int. Conf. on Accous. Sign. Process. (ICASSP)*, 2022
- N. Ahad, J. Qadir, and N. Ahsan, " Neural networks in wireless networks: Techniques, applications and guidelines ", *Journal of network and computer applications*, 2016
- WiSAT: An activity tracker for wheelchair users:
  `https://apps.apple.com/us/app/wisat/id1481120620`