Apoorv Vyas

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RESEARCH INTERESTS

Deep Learning, Automatic Speech Recognition, and Computer Vision

EDUCATION

Indian Institute of Technology, Guwahati   2010-2014
B.Tech, Electronics and Electrical Engineering   CPI - 8.10 (scale of 10.0)

École Polytechnique Fédérale de Lausanne   2018-Present
PhD, Electrical Engineering   CPI - 5.33 (scale of 6.0)

EXPERIENCE

Idiap Research Institute   Martigny
Research Assistant   *July 2018-Present*
- Working on improving speech recognition for low resource languages with unsupervised learning
- Working on scaling Transformer architectures to long sequences

Intel Labs   Bangalore
Systems Engineer   *April 2015–May 2018*
- Developed a method for out of distribution input detection in deep neural networks
- Developed *Low Power Semantic Supervised Shallow Hashing* for fast and accurate retrieval of similar images
- Applied compressed sensing techniques to enable power efficient data gathering in wireless sensor networks

Oracle India Pvt. Ltd.   Bangalore
Applications Engineer   *July 2014–March 2015*
- Worked on web application development using Oracle's application development framework

PEER-REVIEWED PUBLICATIONS

- Vyas, A., Katharopoulos, A., and Fleuret, F. **Fast Transformers with Clustered Attention.** *34th Conference on Neural Information Processing Systems (NeurIPS, to appear), 2020.*

- Katharopoulos, A., Vyas, A., Pappas, N., and Fleuret, F. **Transformers are RNNs: Fast Autoregressive Transformers with Linear Attention.** *37th International Conference on Machine Learning (ICML), 2020.*

- Tong, S., Vyas, A., Garner P., and Bourlard, H. **Unbiased Semi-supervised LF-MMI Training Using Dropout.** *Interspeech, 2019.*

- Vyas, A., Dighe, P., Tong, S., and Bourlard, H. **Analyzing Uncertainties in Speech Recognition Using Dropout.** *International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2019.*

- Vyas, A., Jammalamadaka, N., Zhu, X., Das, D., Kaul, B., and Willke, T. **Out-of-Distribution Detection Using an Ensemble of Self Supervised Leave-out Classifiers.** *European Conference on Computer Vision (ECCV), 2018.*

- Natarajan, V and Vyas, A., **Power Efficient Compressive Sensing for Continuous Monitoring of ECG and PPG in a Wearable System.** *IEEE 3rd World Forum on Internet of Things (WF-IoT), 2016.*

- Vyas, A., Kannao, R., Bhargava, V. and Guha, P., **Commercial Block Detection in Broadcast News Videos.** *ACM, Indian Conference on Computer Vision Graphics and Image Processing (ICVGIP), 2014.*

Patents

- Vyas, A, Mehta, D. & Srenivasa, V., **Low Power Supervised Semantic-Preserving Shallow Hashing.** US Patent 15792940, Intel

- Baxi, A. & Vyas, A, **Power reduction of optical heart rate sensor in a wearable Cuffless Blood Pressure patch by Local Polynomial Regression of sub-sampled PPG and by ECG synchronized PPG excitation.** US Patent 15492986, Intel

- Vyas, A & Natarajan, V., **Power Efficient Data Gathering by Joint Compressive Sensing and Shortest Path Tree for a IoT Mesh Wireless Sensor Network.** US Patent 15856994, Intel

- Vyas, A & Natarajan, V., **Novel anomaly prediction method for intelligent power-efficient relay scheduling in an IoT Mesh Wireless Sensor Network.** US Patent 10448415, Intel

- Natarajan, V. & Vyas, A , **Novel compressive sensing scheme for power efficient data aggregation in a spatial IoT wireless sensor network.** US Patent 10149131, Intel

Technical Skills

Programming: Python, C/C++, CUDA, Shell Scripting
Frameworks: PyTorch, Kaldi, Keras, LaTex
Operating Systems: Linux, Microsoft Windows

Miscellaneous

- Divisional Recognition Award at Intel for excellent contributions to the Bio-sensing project to extract heart rate while typing.

- Secured rank 1901 (out of 500K candidates) in the Joint Entrance Examination (JEE) for IITs.