Akella Ravi Tej

B.Tech. – Electronics and Communication Engineering – Indian Institute of Technology, Roorkee
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Interests

Computer Vision, Deep Learning, Natural Language Processing, Robotics and Reinforcement Learning

Education

Bachelor of Technology (B.Tech) **Indian Institute of Technology, Roorkee, India**
Major in Electronics and Communication Engineering
Minor Specialization in Computer Science and Engineering *2014-2018*

Publication

Workshop Publications

A Randomized Kernel-Based Secret Image Sharing Scheme **WIFS-2018**
Authors: Akella Ravi Tej, Rekula RaviTeja, Dr. Vinod Pankajakshan

- The paper proposes a (k, n)-threshold secret image sharing scheme that offers flexibility in terms of meeting contrasting demands such as information security and storage efficiency.

Experience

Undergraduate Thesis Project

Single Image Super Resolution Using Perceptual Loss
Supervisor: Dr. Vinod Pankajakshan, Assistant Professor, IIT Roorkee *Dec 2017-May 2018*

- Literature survey on deep learning techniques used to solve Super Resolution problem and perceptual loss functions.
- Achieve more realistic SR images by replacing point-wise loss function with perceptual loss.

Research Projects and Internships

Efficient Exploration in State-Action space
Supervisors(remote): Prof. Anima Anandkumar, Bren Professor, California Institute of Technology
Kamyar Azizzadenesheli, Ph.D. Candidate, University of California, Irvine *Aug 2018-Present*

- Joint project between Caltech and DeepMind on unifying Bayesian Deep Q-Network techniques with Gaussian Process Temporal Difference (GPTD) learning to achieve efficient exploration.
- Study count-based exploration approaches that are inspired from intrinsic motivation literature. Based on the works *Bellemare et al. 2016* and *Ostrovski et al. 2017* at DeepMind.

Statistical Modelling of Speech Signals
Supervisors: Dr. Ajit K Chaturvedi, Professor & Director, IIT Roorkee
Dr. R Balasubramanian, Associate Professor, IIT Roorkee *Jan 2018-May 2018*

- Survey deep learning techniques for Speaker Diarisation problem and multi-source separation problem.
- Designed a speaker recognition model using a 3 layer stacked LSTM architecture with 100 hidden units. The network is trained over Voice Conversion (VCC) 2016 dataset.

Paper Implementations

Handwriting Synthesis

- Demonstrates how LSTM networks can be used to generate complex sequences with long range structure. Based on work in *Alex Graves et al.*, 2013 . This work was done as a part of *lyrebird.ai* challenge.

Language Identification

- Train a character-level LSTM model for language identification over DSLCC-v2.0 dataset.
- Inspired from work done in *Stanford Language Identification Engine (SLIDE)*.

Disentangled Learning in β-Variatonal Auto-Encoders

- Balancing the trade-off between disentanglement and reconstruction fidelity by adjusting the hyperparameter β to extract disentangled factors from *dsprites* dataset.
- Disentanglement helps with zero-shot inference and faster knowledge transfer to new tasks. Based on work in β-VAE paper of DeepMind.

Self-supervised Projects

Face Recognition with One-Shot Learning

- Used one-shot learning to build a face recognition system.
- Uses siamese network with triplet loss function.

Art Generation with Neural Style Transfer

- Implementation of *Gatys et al.* paper on neural style transfer.
- Blends low level features of style image with high level features of context image.

Trigger Word Detection

- Detects trigger words from continuous audio stream using LSTM.
- Uses CTC cost for speech recognition.

Debiasing Word Embeddings

- Word embeddings can often represent gender, ethnicity, age and other biases of the text used to train the model. Debiasing is performed on word embeddings to remove observed biases. Based on work in *Bolukbasi et al.*, 2016.

Academic Achievements

- Codechef SnackDown-2016 Elimination Round (Rank-315)
- Ranked in top 1% students of the country in IIT-JEE Advance 2014
- Secured 99.99%tile in IIT-JEE Mains 2014
- KVPY Scholar (SX Stream-2014)
- Silver Certificate (Rank-154) in Technothlon-2013
- Abacus Grand Master SIP Academy (2010)

Computer skills

Programming Languages: Python, Java, C++

Frameworks: Tensorflow, Pytorch, Keras

Audit courses

CSN 471: Computer Vision

CSN 106: Machine Learning

Online Courses

Coursera: Deep Learning Specialization by *Andrew NG, deeplearning.ai*

- Neural Networks and Deep Learning
- Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization
- Structuring Machine Learning Projects
- Convolutional Neural Networks
- Sequence Models

Coursera: Neural Networks for Machine Learning by *Geoffrey Hinton, University of Toronto*

Coursera: Machine Learning by *Andrew NG, Stanford University*

References

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