Akella Ravi Tej

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EDUCATION

IIT ROORKEE

B.Tech in Electronics & Communication
Minors in Computer Science
Jul 2014 - May 2018

LINKS

Website: **akella17.github.io**
Github: **Akella17**
LinkedIn: **akella17**
Twitter: **@ravitej_17**

SKILLS

LANGUAGES

Python, C, C++, Java, Shell, LaTeX, MATLAB and Simulink

TECHNOLOGIES

Git, Linux, TensorFlow, PyTorch

OPEN SOURCE

Open3D [github.com/intel-isl/Open3D]
(2700+ stars, 669+ forks, 60+ contributors)
• Contributor • Open source library for 3D data processing • Part of the non-profit Open Source Vision Foundation (OSVF).

β-VAE [github.com/Akella17/Beta-VAE]
• Implementation of "β-Variational Autoencoders" ***(Burgess et al. 2018)*** using TensorFlow.

Handwriting Synthesis
[github.com/Akella17/Handwriting_Synthesis]
• Implementation of "Generating Sequences With Recurrent Neural Networks" ***(Graves 2013)*** using TensorFlow.

ACHIEVEMENTS

• Recipient of **Nehru Memorial Scholarship** for overall excellence in undergraduate.
• Recipient of **KVPY fellowship** (SX Stream - 2014) in recognition of aptitude for research.
• Secured 99.99 percentile in **IIT-JEE Mains 2014** and an All-India-Rank 1123 in **IIT-JEE Advance 2014**.

EXPERIENCE

TENSORLAB, CALTECH | Project Lead + Main Contributor

Supervisors: Prof. Anima Anandkumar Caltech & Director of NVIDIA ML Research
Dr. Mohammad Ghavamzadeh Senior Research Scientist, Facebook AI Research
Oct 2018 - April 2020

Led a collaborative project between Caltech and Facebook AI Research to develop a new policy gradient estimator based on the Bayesian quadrature framework, that:
• returns more accurate gradient estimates with a significantly lower variance
• offers superior performance, i.e., higher average return and sample efficiency
• is computationally and statistically efficient in high-dimensional continuous domains
Submitted to the **Neural Information Processing Systems** (NeurIPS) 2020. [Preprint]

TEXAS INSTRUMENTS | Internship

May 2017-Jul 2017

• Built the testbench generation and verification pipeline for automatically testing circuit designs, vastly improving the efficiency and productivity of Verification Engineers.
• Organization-wide Deployment: Currently used by all the verification teams at **TI**.
• Received a pre-placement offer to work as a full-time engineer at **TI**, Bangalore.

PROJECTS

INTERPRETABLE MULTIMODAL FUSION | Sept 2019 - Dec 2019

Supervisors: Prof. Pushpak Bhattacharyya Professor & Director, IIT Patna

• Developed a tensor fusion method in PyTorch using block-superdiagonal tensor decomposition, that allows to trade-off the unimodal expressivity and fusion complexity in the learned features.
• Demonstrated a superior performance over linear fusion for sentiment analysis on CMU-MOSI dataset (`YouTube movies with reviews`), with three modalities, *viz.* textual, visual and acoustic.

META-UNSUPERVISED MACHINE TRANSLATION | Jan 2019 - Aug 2020

Supervisors: Prof. Pushpak Bhattacharyya Professor & Director, IIT Patna

• Designed a bi-level optimization scheme for improving the performance of unsupervised neural machine translation (UNMT) systems for low-resource and distant languages.
• Applied meta-learning to obtain a good UNMT initialization on the target language pair, from pre-training on a representative set of source language pairs.
• Developed a resource-efficient implementation in PyTorch that computes the outer-loop gradients using implicit differentiation and the inner-loop objective function.

PUBLICATIONS

MORE TO PERCEPTUAL LOSS IN SUPER RESOLUTION

International Joint Conference on Neural Networks (IJCNN), 2020
Authors: Akella Ravi Tej, S. Halder, A. Shandilya, V. Pankajakshan

• Proposes a novel framework for unifying adversarial and perceptual losses • Filters out the unwanted artifacts introduced by the perceptual loss • Stabilizes adversarial training.

RANDOMIZED KERNEL-BASED SECRET IMAGE SHARING (SIS) SCHEME

IEEE International Workshop on Information Forensics and Security (WIFS), 2018
Authors: Akella Ravi Tej, R. Teja, V. Pankajakshan

• Proposes an SIS scheme that offers (i) perfect threshold secrecy, (ii) optimal share size, and (iii) complete decentralization.