Gopi **Kishan**

Machine Learning Enthusiast

gkishan@cs.iitr.ac.in | GopiKishan14 | gkishan

"What I can not create, I do not understand."

Summary

A curious computer scientist in making trying to find answers and solutions for problems in Artificial Intelligence. Familiar with Machine Learning, Deep Learning, Reinforcement Learning and Computer Science Fundamentals, with a specific interest in Computer Vision, Bayesian Learning and Representation Learning. Easily excited by mathematics, music and tea.

Education

Indian Institute of Technology, Roorkee

Roorkee, India

B.Tech. in Computer Science and Engineering

2017 - Exp. 2021

- CGPA: 9.1/10

Cambridge Public School, Raxaul

Raxaul, India

Grade 12 (Senior Secondary Level)

2017

- Percentage: 90%

Experience

Indian Institute of Science (IISc)

Bangalore, India

Research Internship

May, 2019 - July, 2019

- Summer Research Internship under the guidance of Prof. Debasish Ghose.
- Part of the Guidance, Control and Decision Systems Laboratory (GCDSL) at Department of Aerospace, IISc.
- Worked on model compression techniques.
- Experimented with pruning, weight matrix factorization, quantization and knowledge distillation on DNN and autoencoders.
- Explored latent representation priors in Variational AutoEncoder. Github *link*.

Indian Institute of Technology Bombay

Mumbai, India

Internship

June 2018 - July 2018

- Summer learning based internship under Dr. Biplab Banerjee
- Associated with VIP lab under CSRE department IIT Bombay
- Worked on Face detection algorithms (RCNN, Fast-RCNN, Faster-RCNN, YOLO) on VGG-16 architecture and trained on Widerface dataset.

Projects

Reproducibility Challenge

NeurIPS 2019

Competitive Gradient Descent

Nov 1, 2019 - Dec, 2019

- The paper introduces a novel algorithm for the numerical computation of Nash equilibria of competitive two-player games.
- Following baseline track, I have re-implemented the proposed CGD algorithm in python3 (using PyTorch).
- Find the reproduciblility report and source code in this GitHub *repository*.

PunyNet

DeepMind, hosted at NeurIPS

MicroNet: Large-Scale Model Compression Competition

May, 2019 - Oct, 2019

- This project aimes at efficient inference on CIFAR100 dataset by compressing the model size.
- Quantized a resnet18 model by learning a codebook C that minimizes the difference between the output activations and their reconstructions.
- Detailed decription and code is available *here*.

Self Balancing Bot using RL

IIT Roorkee, India

Project under ARIES, IIT Roorkee

October, 2018 - March, 2019

- This project aimes at stabalising a two wheeled robot using Reinforcement Learning.
- Q-learning algorithm is used to train the bot in virtual environment made using gym and pyBullet.
- Detailed decription and code is available *here*.

Honours & Achievements

2017 **All India Rank - 1114,** JEE Advanced, administered by Indian Institutes of Technology
2017 **All India Rank - 2700,** JEE Main, taken by more than a million students.
2019 **Flipkart Grid-Challenge,** Under top 5 at IITR (and 36th in India).
2019 **Micronet Challenge,** TPU Credits Awardee, Awarded to global top 25 proposals.

AIChallenges

Inter-IIT Tech Meet 8.0 *India*
BITGRIT'S DATA SCIENCE CONTEST *Nov. 2019 - Dec. 2019*
- The problem statement involves modeling of variation of exchange rates between local and foreign currency.

Microsoft AI Challenge *India*
ORGANISED BY MICROSOFT *December 2018*
- phase 1 : Involved improvement in classical page rank algorithm.
- phase 2 : Involved exploration of NLP based technique to find relevant search results on bing search engines.

PanIIT Challenges *India*
ORGANISED BY TATA CONSULTANCY SERVICES LIMITED (TCS) *Jan. 2019*
- Built a tuberculosis detection andriod app based on Deep Visual Attention using TFLite.

Skills

Programming	Python, C++, JAVA, C, Javascript
Frameworks and Packages	Tensorflow, Keras, scikit-learn,, openCV, gym, Numpy, Pandas, Matplotlib
Utilities	Git, Linux Shell, Vim
Relevant Courses (online)	Deeplearning.ai Specialization (by Andrew Ng), csn231n (for Computer Vision) csn229 (for Machine Learning), RL course by David Silver, stat110 (for Probability and Statistics)
Books Referred	Deeplearning by Goodfellow, Pattern Recognition and Machine Learning by Bishop, Reinforcement Learning : An Introduction by S. Sutton
Courses	Mathematics-1 (covered Linear Algebra and Calculus), Optimization Techniques, Discrete Structures, Data Structures and Algorithms

Extracurricular Activity

Google Code-in 2019 *India*
TENSORFLOW MENTOR *Dec,2 2019 - Jan., 2020*
- Here, I lend a helping hand to pre-university students to learn what it's like to work on an open source project.

Artificial Intelligence and Electronic Society (ArIES) *IIT Roorkee, India*
CORE MEMBER *May 2019 - PRESENT*
- Here, I am currently working on robustness against Adversarial Attacks. I am studying various attacks and defence mechanisms with a particular interest in vision models.
- Alongside, I am mentoring the project "Translational Tools" for SHRISTI, an Annual Technical Exhibition of IIT Roorkee.

ACM-IIT Roorkee Chapter *IIT Roorkee, India*
MODERATOR *July 2019 - PRESENT*
- Connected with Association for Computing Machinery (ACM) network.
- As Linux discussion moderator, my responsibility is to organise discussions on Linux OS for freshers and sophomores.

Smart India Hackathon Grand Finale *India*
ORGANISED BY MHRD, INDIA *2019*
- Built a Blockchain based complaint system to assist fixing water wastage issues.

References

Debasish Ghose
Professor
Department of Aerospace Engineering
Indian Institute of Science
dghose@iisc.ac.in
+91-80-22933023

Biplab Banerjee
Assistant Professor
Centre of Studies in Resources Engineering (CSRE)
Indian Institute of Technology Bombay
bbanerjee@iitb.ac.in
+91 22 2576 7688