

Gopi Kishan

MACHINE LEARNING ENTHUSIAST

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"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 & Summer Schools

AI Summer School, Google Research India

B.TECH. IN COMPUTER SCIENCE AND ENGINEERING

- Upcoming Event with opportunity to connect with great researchers at Google AI and DeepMind.

Bangalore, India

Aug 20, 2020 - Aug 22, 2020

CIFAR DLRL Summer School, MILA

SPECIALISED LECTURES IN DEEP LEARNING & REINFORCEMENT LEARNING

- Advanced lectures on topics like Deep Commonsense, Intelligence, Graph Representation Learning,
- Model-Based RL, RL by convex duality, Self-play & Multi-agent systems, Safe RL for Robotics, Meta RL.

Montreal, Canada

Aug 3, 2020 - Aug 7, 2020

CVR-VISTA Summer School, York University

LECTURES IN VISION SCIENCE

- Talks on Vision Science along with its roots in neuroscience, cognitive science, psychology, computer vision
- It was an introduction to various disciplines with vision science at center.

Toronto, Canada

July, 2020

Indian Institute of Technology, Roorkee

B.TECH. IN COMPUTER SCIENCE AND ENGINEERING

- CGPA: 9.14/10

Roorkee, India

2017 - Exp. 2021

Cambridge Public School, Raxaul

GRADE 12 (SENIOR SECONDARY LEVEL)

- Percentage: 90%

Raxaul, India

2017

Experience

International Conference on Machine Learning (ICML) 2020

VOLUNTEER AND ATTENDEE AT ICML'20

- As a volunteer, my role was mainly to read some papers submitted to conference and frame few questions related to it.
- As an Attendee, it was the first time I was exposed to such an excellent research community. I learnt a lot. It was fun.

Virtual

July 12, 2020 - July 18, 2020

Max Planck Institute - Intelligent System (MPI-IS)

REMOTE RESEARCH INTERNSHIP

- Summer Research Internship under the guidance of Prof. Stefan Bauer and post-doc Xiaoguang Dong.
- Working jointly with Empirical Inference and Physical Intelligence Departments
- Work involves building a gym-simulator for particles and applying Deep Reinforcement Learning for control.
- Next step will be sim2real onsite depending on COVID-19 situation

Tübingen, Germany

*May, 2020 - *Dec, 2020*

University of British Columbia, Okanagan (UBCO)

PROJECT COLLABORATION

- Collaborating on project under the guidance of Prof. Apurva Narayan, Department of Computer Science, UBCO
- Part of the Data Science and Artificial Intelligence Group (DSAIG)
- Work involves verification of robustness of Deep Learning systems.

British Columbia, Canada

Since April, 2020

Indian Institute of Science (IISc)

RESEARCH INTERNSHIP

Bangalore, India

May, 2019 - Dec, 2019

- Summer Research Internship under the guidance of Prof. Debasish Ghose.
- Part of the Guidance, Control and Decision Systems Laboratory (GCDSL) at the 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 (IIT B)

INTERNSHIP

Mumbai, India

June 2018 - July 2018

- Summer internship under the supervision of 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

Quantum Machine Learning

LAB BASED PROJECT

IIT Roorkee 2020

Jan, 2020 - June, 2020

- This project, under the guidance of Dr Sugata Gangopadhyay, aims at applying the advantages of quantum computing to Deep Learning.
- Explored the structure of Quantum GANs and method to discriminate a randomly initialised qubit.
- For a complete detail refer my *report* and *presentation* on this project and play around the experiments in google colab [here](#) and [here](#).

Reproducibility Challenge

COMPETITIVE GRADIENT DESCENT

NeurIPS 2019

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).
- The reproducibility report is published at *arXiv* and source code in this GitHub *repository*.

PunyNet

MICRONET: LARGE-SCALE MODEL COMPRESSION COMPETITION

DeepMind, hosted at NeurIPS 2019

May, 2019 - Oct, 2019

- This project aims 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 description and code are available [here](#).

Self Balancing Bot using RL

PROJECT UNDER ARIES, IIT ROORKEE

IIT Roorkee, India

October, 2018 - March, 2019

- This project aims at stabilising a two-wheeled robot using Reinforcement Learning.
- Q-learning algorithm is used to train the bot in a virtual environment made using gym and pyBullet.
- Detailed description and code are available [here](#).

Honours & Achievements

2020	Google AI Summer School , Shortlisted for virtually attending the AI summer school event.	Bangalore, India
2020	DRLRSS, MILA , Selected under highly competitive CIFAR MILA summer school. Goes virtual due to COVID-19	Montreal, Canada
2020	ICML , Selected for volunteer at virtual ICML conference.	
2020	CVRSS , Selected (under 30) for Vision Science Summer School. Goes Virtual due to COVID-19	Toronto, Canada
2020	MITACS GRI Fellow , Selected for the MITACS GRI program. Cancelled due to COVID-19	UBCO, Canada
2019	Micronet Challenge , TPU Credits Awardee, Awarded to global top 25 proposals.	Global
2019	Flipkart Grid-Challenge , Under top 5 at IITR (and 36th in India).	India
2017	All India Rank - 1114 , JEE Advanced, administered by Indian Institutes of Technology	India
2017	All India Rank - 2700 , JEE Main, taken by more than a million students.	India

AIChallenges

IDAO 2020

INTERNATIONAL DATA ANALYSIS OLYMPIAD 2020

Online Round

Jan 15, 2020 - Feb 11, 2020

- The problem statement involves modeling of accurate trajectories of satellites from previous data. Repo at [link](#).

Inter-IIT Tech Meet 8.0

BITGRIT'S DATA SCIENCE CONTEST

India

Nov. 2019 - Dec. 2019

- The problem statement involves modeling of variation of exchange rates between local and foreign currency.

PanIIT Challenge 2019

ORGANISED BY TATA CONSULTANCY SERVICES LIMITED (TCS)

- Built a tuberculosis detection android app based on Deep Visual Attention using TFLite.

India

Jan. 2019

Microsoft AI Challenge 2018

ORGANISED BY MICROSOFT

- 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.

India

December 2018

Writing

Tricks for Manipulating Probability

WRITER

Medium

Dec 20, 2019

- Published at towards data science, medium, this blog aims at summing up together the various techniques applied in different probability problems to make calculations easier and, sometimes, even possible! [Read](#)

Skills

Programming	Python, C++, JAVA, C, Javascript
Frameworks and Packages	Tensorflow, Keras, scikit-learn, openCV, gym, Numpy, Pandas, Matplotlib
Utilities	Git, Linux Shell, Vim, VS Code, GitHub, jupyter
Relevant Courses (online)	Deeplearning.ai Specialization (by Andrew Ng), cs231n (for Computer Vision) cs229 (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, Artificial Intelligence Signal and Systems, Discrete Structures, Data Structures and Algorithms, Machine Learning, Quantum Computing

Extracurricular Activity

Google Code-in 2019

TENSORFLOW MENTOR

India

Dec, 2019 - Jan., 2020

- Here, I lent 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)

CORE MEMBER

IIT Roorkee, India

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 have mentored the project "Translational Tools" for SHRISTI, an Annual Technical Exhibition of IIT Roorkee.

ACM-IIT Roorkee Chapter

OUTREACH HEAD, (PREVIOUSLY MODERATOR)

IIT Roorkee, India

July 2019 - PRESENT

- As Outreach Head, I connect researchers from ACM network and organise talks.
- As Linux discussion moderator, my responsibility was to organise discussions on Linux OS for freshers and sophomores.

Smart India Hackathon Grand Finale

ORGANISED BY MHRD, INDIA

India

2019

- Built a Blockchain based complaint system to assist fixing water wastage issues.

References

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