Abinav Ravi Venkatakrishnan

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EDUCATION

M.Sc in Computational Science and Engineering 2017 - Present(2020 Sept expected)
Department of Informatics, Technical University Munich
B.Tech in Mechanical Engineering Amrita School Of Engineering,Bengaluru, India CGPA - **9.17**/10
(First Class with Distinction)[1] 2012 - 2016

EXPERIENCE

- **Research Engineer,OpenMined** May 2020-present
  Open Source research project on Outlier robust aggregators for Federated learning. The objective is
  to compile the algorithms into a open source library that is compatible with PySyft

- **Junior Data Scientist- Working Student, deepc** June 2019-Present

  1. Support in deployment of product in Klinikum rechts der Isar

  2. Technological evaluation of new use cases by conducting literature review, survey of dataset and
     creating baseline models

  3. Support in detection of skull fractures, Anonymization of head CT scans, testing for Generalization

- **Working Student Data Science, The Mobility House Gmbh** Oct 2018 - Mar 2019

  1. Conducted Data Analysis of Charging Behaviour for vehicle to grid projects (Time series Data).

  2. Conducted Data analysis for pooling concept for frequency containment reserve.

  3. Pattern recognition and forecasting of Energy market data for trading strategies.

- **Associate Software Engineer - Design , Robert Bosch Engineering and Business Solutions,
  Coimbatore** September, 2016 - September 2017

  1. Design of Small wiper motor from Benchmarking data.

  2. Design of closure mechanism for Bottom guard in Circular saw power tool

TECHNICAL
SKILLS

Programming Languages - Python, C++,Julia ,Javascript(basic)
Tools and Libraries -Numpy, Scipy, Matplotlib, scikit learn, scikit image, Pytorch, Pandas,MPI, OpenMP,
OpenCV, MySQL, RabbitMQ, Docker,Flask, Gitlab Runner,PySyft,PyGrid
Cloud Platforms - AWS, Google Cloud

PUBLICATIONS

- Suprosanna.S,**Abinav Ravi Venkatakrishnan**,Ivan Ezhov, Jana Lipkova,Marie Piraud,Bjoern Menze
  ,"Implicit Neural Solver for Time-dependent Linear PDEs with Convergence Guarantee", **NeurIPS work-
  shop on Machine learning with convergence Guarantees**,view here

- **Abinav R** ,Nandu .R.Nair,P.Shravan,Pradeesh Kumar and S.R.Nagaraja ,"CFD Analysis of Co-Flow Jet
  Airfoil", Indian Journal of Science and technology, vol.9 Issue.45 view here

- **Abinav R**, Nambiar G.K, Sahu D, "A case study on low power vapour compression refrigeration system",
  IOP Conference Series,Material science and Engineering, vol 149, July 2015. view here

RELEVANT
COURSES

- **Courses** : Machine Learning, Introduction to Deep learning, Advanced deep learning for physics, Image
  processing for physics, Visual Data Analytics, Scientific Computing, Data Innovation lab, Computer vision-
  Object tracking and detection.

PRESENTATIONS

- **Seminar on 3D computer vision and deep learning** Presentation of the paper MapNet and report
  prepared for the seminar course on 3D computer vision and Deep learning November 2018

- **Introduction to Scientific Computing with Python** Basic Introduction to scientific computing using
  Numpy at Amrita School of Engineering Bangalore March 2018

- **Final Product presentation Amrita TBI Tide** Final presentation for the Project portable solar
  refrigerator at Amrita TBI Amritapuri, Kerala July 2015

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[1]Max 10.0 Min 5.0

PROJECTS

- **Train a medical image model across hospitals with PyGrid** The objective of the project is to use federated learning tool of PyGrid and Pysyft to train a distributed dataset of medical images. The end result is expected to published as a tutorial on Openmined Blog   July 2020 - Present

- **How to train small and reliable Cancer detectors?** Objective is to use Out of Distribution detection for reliable detection and distillation to compress models for deployment in resource constraint environments   Dec2019 - Feb2020

- **Self Supervised OOD-Detection for medical applications (Master thesis)** Using self-supervision for classifying a sample as in or out of distribution uses a supervoxel classification for localization of anomaly in clinical CT brain scans   Sept 2019 - Present

- **Inverse Problems in PDE driven process using Deep learning** A guided research project on using data driven discovery techniques for finding underlying Partial Differential Equations.Convergence Guarantees of the considered method are also studied   Apr2019-Oct2019

- **Stroke Detection** Built a deep learning model for stroke detection on BRATS dataset using a Fully Convolutional encoder and fully transpose convolution decoder for segmentation of stroke.   May 2019

- **A Network Analytical take on European parliament**: Built topic model from European parliament speeches and then built a network model and did community detection on the network model to find Hidden agenda.   Oct 2018-Feb 2019

- **Physics Aware Generative Adversarial Network**: Application of Generative Adversarial Network on Velocity simulation of a smoke flow.The goal was to extend the simulation on higher resolution while training on a lower resolution   Apr-July 2018

ACHIEVEMENTS AND AWARDS

- Selected in OpenMined Research Engineers program

- Won first place in HackaTUM hackathon 2019

- Published extended Abstract in Machine learning with Guarantees workshop at NeurIPS conference 2019.

- Selected for NASSMA summer school in Ben Guerir, Morocco, 2019 with complete scholarship.

- Selected for prestigious *Amrita TBI TIDE Innovation award and seed grant* in 2015

- Won the Bright Idea Award for Fabrication of solar refrigerator

- Graduated Bachelors in Technology in Mechanical Engineering with First Class and distinction . Awarded to people with CGPA more than 8/10 and a publication in international Conference or Journal