Abinav Ravi Venkatakrishnan

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Experience

- **Data Scientist (EU Blue card holder)** deepc gmbh — Oct 2020 - Present
  1. Developing Proof of concept Machine learning services for various use-cases (View position detection, Anonymization)
  2. Development of structured dataset API along with dashboard UI
  3. Development and management of preprocessing pipeline for brain CT scans.
  4. Code testing and Refactoring, increased test code coverage by 5% by refactoring and adding tests to refactored modules.
- **Junior Data Scientist- Working Student,** deepc gmbh — June 2019-Oct 2020
  1. Developed novel methods for fracture detection of skull improving business usecase bringing in potential of new customers with access to multiple lab locations.
  2. Increased documentation and logging coverage in Back end API by 5% and 20% respectively
  3. Technical Evaluation of 3 new use-case was done by evaluating existing data sources, creating new model prototypes which can increase potential revenue by 100%
  4. Run frequent inference on updated production models and report the metrics. Proposed a new technique for calibrating deep models to new site.
- **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

Open Source

- **Developer** PipelineDP(OpenMined) in collaboration with google with Issue contributed — Feb 2021 - Present
- **Writing team lead** OpenMined Writing — July 2021 - Present
- **Research Engineer** OpenMined research — Oct 2020 - Present
- **Writer contributor, OpenMined blog** OpenMined Blog — Oct 2020 - Present
  1. Published the post and post in OpenMined blog as a part of summarizing the Privacy conference.

Technical Skills

Programming Languages - Python(Advanced), C(Intermediate), bash scripting(Intermediate), C++(Basic) ,Javascript(basic),Rust(Basic),
Data Science tools -Numpy, Scipy,matplotlib, scikit learn, scikit image, Pytorch, Pandas, OpenCV ,Flask, Gitlab Runner,PySyft, Plotly Dash
Database MySQL, MongoDB
DevOps Tool Docker, Kubernetes (Knative), Gitlab runner, Jenkins,Terraform.
Cloud Platforms - AWS, Google Cloud

Projects

- **Self Supervised OOD-Detection for medical applications (Master thesis)** Developed novel algorithm that proposes new anomaly score that detects Anomaly in Brain CT scans. State of the art results were achieved for in-house dataset by improvement of over 7% previous methods Sept 2019 - July 2020
  TOOLS PyTorch, Numpy, Nibabel, Scikit-learn, Scikit-image, GCP
- **How to train small and reliable Cancer detectors?** Developed a novel reliable classifier for skin cancer detection using ISIC 2018 dataset. The reliable classification accuracy is 71% after incorporating Out of Distribution detection. Dec2019 - Feb2020
  TOOLS: PyTorch, Numpy, Scikit-image, GCP
- **Inverse Problems in PDE driven process using Deep learning** Developed a deep learning model that learns on simulated heat equation data based on fenics. It has been shown that the error propagation and time to converged solution is 300 times less when comparing neural solver with Finite element solver with theoretical guarantees. Apr2019-Oct2019
  TOOLS PyTorch, Numpy, Fenics
  Other projects can be found at GitHub

Education

M.Sc, Computational Science and Engineering
Department of Informatics, Technical University Munich 2017 - 2020
B.Tech, Mechanical Engineering Amrita School Of Engineering,Bengaluru, India (First Class with Distinction) 2012 - 2016

Publications

- **Abinav Ravi Venkatakrishnan**, Seong Tae Kim, Rami Eisawy, Franz Pfister, Nassir Navab, "Self supervised Out of distribution detection in Brain CT scans", **Med Neurips 2020**, view here
- 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 workshop 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

Paper Review

- Reviewer for Distributed and Private Machine learning workshop at ICLR 2021 Mar 2021
- Reviewer for Secure and Privacy preserving machine learning for medical imaging workshop and tutorial at MICCAI 2021 July 2021

Presentations

- **Meetup talk on Out of Distribution detection** Presentation on how to include out of distribution detection for deployed classifiers to make them more reliable. Sept 2020
- **Thesis defense** Master Thesis defense on self supervised Out of Distribution detection for Medical applications in CAMP chair Aug 2020
- **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

Achievements

- Published extended Abstract in med-neurips 2020 workshop at NeurIPS 2020 conference
- Selected in OpenMined Research Engineers program among 28 people
- Won first place in HackaTUM hackathon 2019 among 12 teams in Allianz challenge
- 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.
- 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