Ajay **Navilarekal Rajgopal**

Graduate Student, 27

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Education

Technical University of Braunschweig — *Braunschweig, Germany*

M.Sc. Computational Sciences in Engineering — *Sep. 2018 - Sep. 2022*

- GPA: 1.3/1
- Areas of interest: Statistical Analysis, Machine Learning, Deep Learning

Academic Projects

Learning causal factors from in-vehicle bus signals — *AUDI AG, Ingolstadt, Germany*

Master's thesis, Supervisors: **Dr.-Ing. Andreas Tollkühn**, AUDI AG and **Prof. Dr. Dirk Lorenz**, TU BS — *Apr. 2022 - Sep. 2022*

- Modelling causal structure of in-vehicle events using in-vehicle bus signals
- Implementing the approaches in Python
- Evaluation of implemented approaches against a synthetic dataset

Differentiable Optimization as a layer in neural networks — *TU Braunschweig*

Student Research Project, Supervisors: **Prof. Dr. Dirk Lorenz**, **Dr. Christoph Brauer** — *June 2020 - Feb. 2022*

- Theoretical understanding of the backpropagation algorithm for the differential optimization layer
- Evaluation of two standard packages - `qpth` and `cvxpy` against a toy problem
- Application to Speech Signal Dequantization problem; performance comparison with algorithm unrolling

Experience

AUDI AG — *Ingolstadt, Germany*

Intern — *Mar 2021 - July 2021*

- Statistical analysis of Brake Cooling Simulations data; Gaussian process based Experiment proposals
- Research plan design for Feature Selection for Car Functions Recommender System based on Bus Data

Institute for Analysis and Algebra, TU Braunschweig — *Braunschweig, Germany*

Student Research Assistant — *June 2020 - Present*

- Prototyping and experimentation of novel architectures of Graph Neural Networks for Graph Regression task
- Optimize implementation of developed architectures using PyTorch Geometric to handle large datasets

Institute for Partial Differential Equations, TU Braunschweig — *Braunschweig, Germany*

Teaching Assistant, *Ordinary Differential Equations* and *Numerical Methods* — *Nov 2019 - Jul 2020*

- Assignment tasks preparation, grade students' assignments & exams
- Conducted workshop *Introduction to MATLAB* for incoming students

Institute for Scientific Computing, TU Braunschweig — *Braunschweig, Germany*

Student Research Assistant — *Apr 2019 - Jul 2020*

- Surrogate model development for plasticity damage models using deep neural networks
- Detection of hidden classes using deep neural networks

Mercedes Benz Research & Development India — *Bengaluru, India*

Junior Product Design Engineer — *Aug 2016 - Aug 2018*

- Component development for AdBlue, Exhaust and Air Intake subsystems for Mercedes Benz Trucks
- Devise simple calculators and automation tools in order to avoid repetitive tasks in design and drawing process

Skills

Programming Languages	Python, MATLAB/Simulink
Libraries	TensorFlow, PyTorch, Pytorch Geometric, Pandas, SciPy, Numpy, Scikit-Learn, Matplotlib
Machine Learning	Statistical analysis, ML algorithms, Artificial Neural Networks, Classification & Regression
Miscellaneous	Linux, git, `vim`, LaTeX, bash
Languages	Kannada, Tamil, Hindi, English (C1), German (C1)

Additional Information

- Participant in the Brains, Minds and Machines summer course conducted by Center for Brains, Minds and Machines headquartered at MIT, USA
- Winner of the *Neural Art Contest* at the TU Braunschweig, where a team of two had to generate images using the concept *Neural Style Transfer*

References

Prof. Dr. Dirk Lorenz
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Dr.-Ing. Andreas Tollkühn
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