Mahalakshmi Sabanayagam

Email | LinkedIn | Github | Google Scholar | Website

Research Interest

I am interested in the theory of machine learning and deep learning, primarily in understanding the connection of deep networks to kernels and its adversarial robustness. I am also interested in graph based learning problems and statistical learning theory.

Education

Ph.D. in Computer Science — August 2021 – Present
Technical University of Munich, Germany
Advisor: *Prof. Debarghya Ghoshdastidar*

Master of Science, Informatics — October 2018 – June 2021
Technical University of Munich, Germany — *CGPA: 1.3 (best of 1.0)*

Bachelor of Technology, Computer Science & Engineering — July 2011 – May 2015
National Institute of Technology, Trichy, India — *CGPA: 9.37 (best of 10)*

Publications

4. **Analysis of Graph Convolutional Networks using Neural Tangent Kernels** [arxiv]
   Mahalakshmi Sabanayagam, Pascal Esser, Debarghya Ghoshdastidar
   MLG workshop at European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases ***(ECML PKDD 2022)***

3. **Graphon based Clustering and Testing of Networks: Algorithms and Theory** [arxiv]
   Mahalakshmi Sabanayagam, Leena Chennuru Vankadara, Debarghya Ghoshdastidar
   International Conference on Learning Representations 2022 ***(ICLR 2022)***

2. **Rough Set-based Feature Selection for Credit Risk Prediction using Weight Adjusted Boosting Ensemble Method** [springer]
   Sivasankar E, Selvi C, Mahalakshmi S
   Journal of Soft Computing 2019

1. **Cross Domain Sentiment Analysis Using Different Machine Learning Techniques** [springer]
   Mahalakshmi S, Sivasankar E
   Fifth International Conference on Fuzzy and Neuro Computing ***(FANCCO) 2015*** and as poster in *Grace Hopper Celebration India* ***(GHCI) 2016***

Preprints

1. **Machine learning-based image detection for lensless microscopy in life science** [link]
   Mahalakshmi Sabanayagam, Jan Brunckhorst, Andreas Pirchner, Nikhitha Radhakrishna Naik

Research Experience

- Summer School on Statistical Physics & Machine Learning, July 04 - 29, 2022

Teaching Activities / Student Jobs

- *Teaching Assistant* for Seminar on Theoretical Advances in Deep Learning (WS 2022/23)
- *Teaching Assistant* for Statistical Foundations of Learning (SS 2022)
- *Teaching Assistant* for Practical Course - Analysis of new phenomena in machine/deep learning (SS 2022)
- *Teaching Assistant* for Gems of Informatics 3: Modelling and analysis of real-world graphs (WS 2021/22, WS 2022/23)

- *Student Tutor* for Efficient Algorithms & Data Structures (WS 2020/21)
- *Research Assistant* in Certifiable AI at Fraunhofer-Institute, Munich (Sept 2020 – Feb 2021): Worked on novel ways to quantify risk in object detectors
- *Working Student* in Innovation Department at Osram Gmbh, Munich (Sept 2019 – Dec 2019): Developed faster RCNN and YOLO based models for detection, identification and tracking of multiple traffic objects

Technical Skills

Languages: C++ (Proficient), Python (Proficient), Java (Good)
Technologies: Tensorflow, Pytorch, NetworkX, Chromium Embedded Framework, OpenCV, AWS, Git

Professional Experience

Computer Scientist 1 July 2015 – September 2018
Adobe Systems, Bengaluru, India

- **Modernization of Dreamweaver**: Developed a robust OS agnostic (Mac/Windows) framework, resembling MFC in its design to use in-house library for rendering
- **HiDPI Aware functionality on Windows**: Created an interface for HiDPI adaptation in the aforementioned framework thereby completely avoiding code changes in the client side

Recognized as a top-performer and was awarded two early promotions - Member of Technical Staff 2 in January 2017 and Computer Scientist 1 in January 2018.

Research Intern May 2014 – July 2014
Samsung R&D Institute, Bengaluru, India

- Implemented a module for secure log-out in Android Browser of Samsung
- Worked on improving the efficiency of Optical Character Recognition using Tesseract and OpenCV

Languages

Tamil (mother tongue), English (fluent), German (basic)

Awards & Honors

- Awarded the largest sustainability impact award by **Siemens AI@sustainability Hackathon, 2020** for the AI solution towards finding new strategies that reduce the spread of COVID-19
- Awarded 2nd place in Female Tech Leaders Hackathon on **Introduction to Big Data: COVID-19 and its Global Effects, 2020** for analysing COVID-19 related tweets and the impact on equities
- Finalist in **Mobility Innovation Competition @ Campus, 2019** conducted by Zentrum Digitalisierung Bayern (ZD.B)
- **OPJEMS (O.P. Jindal Engineering and Management Scholarship) Scholar, 2012** for excellent academic record and leadership qualities
- Received **Bachelor's Study scholarship** from NLC for the period 2011 – 2015

Other Activities

- **Technovation Mentor** for guiding underprivileged middle school girls in Technovation Challenge 2018
- Volunteer at **Help Age India**, created awareness and raised funds for the care of elderly in 2004 and 2007

References

Dr. Debarghya Ghoshdastidar *Email*
Assistant Professor, Theoretical Foundations of Artificial Intelligence, TU Munich

Dr. E. Sivasankar *Email*
Assistant Professor, National Institute of Technology, Trichy, India