

Mahalakshmi Sabanayagam

[Email](#) | [LinkedIn](#) | [Github](#) | [Google Scholar](#) | [Website](#)

RESEARCH INTEREST

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

EDUCATION

Ph.D. in Computer Science Technical University of Munich, Germany Advisor: <i>Prof. Debarghya Ghoshdastidar</i>	August 2021 – Present
Master of Science , Informatics Technical University of Munich, Germany	October 2018 – June 2021 <i>CGPA: 1.3 (best of 1.0)</i>
Bachelor of Technology , Computer Science & Engineering National Institute of Technology, Trichy, India	July 2011 – May 2015 <i>CGPA: 9.37 (best of 10)</i>

PUBLICATIONS

5. **Improved Representation Learning Through Tensorized Autoencoders** [\[arxiv\]](#)
Pascal Esser*, Satyaki Mukherjee*, Mahalakshmi Sabanayagam*, Debarghya Ghoshdastidar
International Conference on Artificial Intelligence and Statistics (AISTATS 2023)
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 / UNDER REVIEW

4. **Unveiling the Hessian's Connection to the Decision Boundary** [\[arxiv\]](#)
Mahalakshmi Sabanayagam*, Freya Behrens*, Urte Adomaityte, Anna Dawid
3. **Analyzing Graph Neural Network Architectures through the Neural Tangent Kernel** [\[arxiv\]](#)
Mahalakshmi Sabanayagam, Pascal Esser, Debarghya Ghoshdastidar
2. **Fast Adaptive Test-Time Defense with Robust Features**
Anurag Singh, Mahalakshmi Sabanayagam, Krikamol Muandet, Debarghya Ghoshdastidar
1. **Machine learning-based image detection for lensless microscopy in life science** [\[link\]](#)
Mahalakshmi Sabanayagam, Jan Brunckhorst, Andreas Pirchner, Nikhitha Radhakrishna Naik

RESEARCH EXPERIENCE / ACTIVITIES

- *Research visit:* New York University, USA. **Host:** Prof. Julia Kempe March – June, 2023
- *Summer School:* Statistical Physics & Machine Learning, Les Houches, France July, 2022
- *Reviewer:* AISTATS 2023

TEACHING / STUDENT JOBS

- *Teaching Assistant* for Seminar on Theoretical Advances in Deep Learning (WS 2022/23), Statistical Foundations of Learning (SS 2022), Analysis of new phenomena in machine/deep learning (SS 2022, SS 2023), Gems of Informatics 3: Modelling and analysis of graphs (WS 2021/22, WS 2022/23), 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

PROFESSIONAL EXPERIENCE

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

- **Modernization of Dreamweaver:** Developed a robust OS agnostic (Mac/Windows) framework
- **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

TECHNICAL SKILLS

Languages: C++ (Proficient), Python (Proficient), Java (Good)

Technologies: Tensorflow, Pytorch, NetworkX, Chromium Embedded Framework, OpenCV, AWS, Git

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

LANGUAGES

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

REFERENCES

Dr. Debarghya Ghoshdastidar

[Email](#)

Assistant Professor, Theoretical Foundations of Artificial Intelligence, TU Munich

Dr. Julia Kempe

[Email](#)

Professor, Computer Science, Mathematics and Data Science, New York University

Dr. E. Sivasankar

[Email](#)

Assistant Professor, National Institute of Technology, Trichy, India