

EDUCATION

PhD & SM, Massachusetts Institute of Technology, Cambridge, MA

09/16 – 08/21

Computer Science with focus on Machine Learning and Robotics

GPA: 5.0/5.0

PhD Thesis: Efficient deep learning: from theory to practice.

SM Thesis: Contract-based safety verification for autonomous driving.

B.Sc., ETH Zurich, Switzerland

09/12 – 08/15

Mechanical Engineering, Major: Robotics and Control

GPA 5.86/6.00 (with highest distinction), Valedictorian

Thesis: Autonomous pairing of distributed flight array modules.

RELEVANT EXPERIENCE

Manager, Deep Learning Algorithms & Generative AI

New York, NY

Nvidia

02/23 – Present

- The goal of my team is to build software for training and fine-tuning deep learning models (GenAI, AV,...) to improve their inference efficiency and resource consumption.
- Lead on research for algorithmic model optimization of LLM/GenAI models.
- We enable ML teams working with large-scale models to seamlessly productionize and deploy their models through our integrated software platform.
- Our work spans from applied foundation model research and neural architecture search to sparsity and quantization, as well as the development of production software.

Chief Architect & Founding Engineer

San Jose, CA

OmniML (acquired by Nvidia)

10/21 – 02/23

- Lead the design of the neural network model optimization framework and python package, which is the company's core product used by most customers.
- Supervised a team of engineers and scientists in R&D work towards new product features.

Machine Learning Consultant

Somerville, MA

Neural Magic

07/21 – 10/21

- Consulted the team on state-of-the-art neural network model optimization techniques.
- Recommended specific actions to improve accuracy & latency (model pruning, NAS, ...).

PhD Researcher

Cambridge, MA

MIT CSAIL, Advisor: Prof. Daniela Rus

09/16 – 08/21

- Research in provable compression methods and neural network model optimization.
- Developed novel verification algorithms for safe motion planning in autonomous driving.

Researcher & Software Engineering Intern, Autopilot

Palo Alto, CA

Tesla

06/19 – 09/19

- Lead the design and development of a lateral motion planner (now part of Tesla FSD).
- Standardized planner testing infrastructure leading to accelerated prototyping.

Researcher & Software Engineering Intern, Motion Planning

Singapore

nuTonomy Asia

12/15 – 02/16

- Developed, implemented, and supervised the automated cruise control software.
- Restructured and oversaw a more efficient compilation and installation process.

SKILLS AND INTERESTS

- Software:** Python, PyTorch, NumPy, Kubernetes, Docker, Linux (Unix), C/C++, TensorFlow
- Languages:** English (fluent), German (native), Spanish (intermediate), French (intermediate), Latin (basic)
- Interests:** sports (biking, running, swimming, skiing, hiking), traveling, photography, cultural experiences

SELECTED PUBLICATIONS (*equal contribution)

1. Hasani, R., Lechner, M., Amini, A., Liebenwein, L., Ray, A., Tschaikowski, M., Teschl, G. and Rus, D., 2022. Closed-form continuous-time neural networks. *Nature Machine Intelligence*, 4(11), pp.992-1003.
2. Babaiee, Z., Liebenwein, L., Hasani, R., Rus, D. and Grosu, R., 2022. Pruning by Active Attention Manipulation. arXiv preprint arXiv:2210.11114.
3. Baykal*, C., Liebenwein*, L., Gilitschenski, I., Feldman, D. and Rus, D., 2022. Sensitivity-informed provable pruning of neural networks. *SIAM Journal on Mathematics of Data Science*, 4(1), pp.26-45.
4. Liebenwein, L., Maalouf, A., Feldman, D. and Rus, D., 2021. Compressing neural networks: Towards determining the optimal layer-wise decomposition. *Advances in Neural Information Processing Systems*, 34, pp.5328-5344.
5. Liebenwein, L., Hasani, R., Amini, A. and Rus, D., 2021. Sparse flows: Pruning continuous-depth models. *Advances in Neural Information Processing Systems*, 34, pp.22628-22642.
6. Liebenwein, L., Baykal, C., Carter, B., Gifford, D. and Rus, D., 2021. Lost in Pruning: The Effects of Pruning Neural Networks beyond Test Accuracy. *Proceedings of Machine Learning and Systems*, 3.
7. Baykal, C., Liebenwein, L., Feldman, D. and Rus, D., 2021. Low-Regret Active learning. arXiv preprint arXiv:2104.02822.
8. Schwarting*, W., Seyde*, T., Gilitschenski*, I., Liebenwein, L., Sander, R., Karaman, S., & Rus, D. (2020). Deep latent competition: Learning to race using visual control policies in latent space. In *Conference on Robot Learning (CoRL)*.
9. Liebenwein*, L., Baykal*, C., Lang, H., Feldman, D. and Rus, D., 2020. Provable Filter Pruning for Efficient Neural Networks. In *International Conference on Learning Representations*.
10. Lütjens, B., Liebenwein, L. and Kramer, K., 2019. Machine Learning-based Estimation of Forest Carbon Stocks to increase Transparency of Forest Preservation Efforts. *NeurIPS Workshop Tackling Climate Change with Machine Learning*.
11. Baykal*, C., Liebenwein*, L., Gilitschenski, I., Feldman, D. and Rus, D., 2019. Data-dependent coresets for compressing neural networks with applications to generalization bounds. In *International Conference on Learning Representations*.
12. DeCastro*, J., Liebenwein*, L., Vasile, C.I., Tedrake, R., Karaman, S. and Rus, D., 2018. Counterexample-guided safety contracts for autonomous driving. In *International Workshop on the Algorithmic Foundations of Robotics*.
13. Liebenwein*, L., Baykal*, C., Gilitschenski, I., Karaman, S. and Rus, D., 2018. Sampling-based approximation algorithms for reachability analysis with provable guarantees. In *Robotics: Science and Systems*.
14. Liebenwein, L., Schwarting, W., Vasile, C.I., DeCastro, J., Alonso-Mora, J., Karaman, S. and Rus, D., 2020. Compositional and contract-based verification for autonomous driving on road networks. In *Robotics Research* (pp. 163-181). Springer, Cham.

HONORS

Outstanding Reviewer (ICLR 2021) | Top 10% Reviewer (NeurIPS 2020) | Microsoft AI for Earth Grant | MIT Ideas Challenge | MIT Sandbox | Qualcomm Innovation Fellowship Finalist, 2018 | Outstanding Bachelor's Award, ETH, 2016 (Top Graduate, Class of '15) | Excellence Scholarship and Opportunity Award, ETH, 2015 | Outstanding Bachelor's Award, ETH, 2012 (Top 3 First-Year)