BATUHAN K. KARAMAN

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INTERESTS

LLM post-training	Reasoning, VLLMs, RLVR/RLHF, Alignment, Responsible AI

EDUCATION

Cornell University   Ithaca, NY
Ph.D. in Electrical and Computer Engineering   2020 - 2026
Advisor: Mert Sabuncu

Middle East Technical University   Ankara, Turkey
B.S. in Electrical and Electronics Engineering   2015 - 2020

SKILLS

Languages	Python, R, MATLAB, C/C++
Frameworks	PyTorch, Verl, Huggingface, TensorFlow, NetworkX
Statistical Analysis	Hypothesis testing, Data visualization
Others	AWS, Kubernetes, Ray, Azure, Linux

EXPERIENCE

Cornell University   New York, NY
Graduate Research Assistant   Sep 2020 - Present
Supervisors: Mert Sabuncu, Ray Razlighi (from Weill Cornell Medicine Radiology)

- My PhD research focuses on developing computer vision and time-series methods to predict clinical outcomes from multimodal biomedical data.

Amazon AGI   Sunnyvale, CA
Applied Scientist Intern   Jun 2025 - Sep 2025
Supervisors: Mohammad Ghavamzadeh, Arijit Biswas, Ruida Zhou

- Developed a novel REINFORCE-based RLVR algorithm that achieves state-of-the-art performance on various math reasoning benchmarks using Qwen- and Llama-family models.
- Analyzed the sources of instability in the REINFORCE Algorithm.

Microsoft AI   Redmond, WA
Applied Scientist Intern   Jun 2024 - Aug 2024
Supervisors: Xia Song, Alon Benhaim, Maggie Engler (previously at Inflection AI)

- Worked on the safety and usefulness balance of Llama- and Phi-family models through SFT and preference optimization.
- Developed a novel preference optimization method, achieving a 30% reduction in model overrefusals.

Spectral AI   Dallas, TX (Remote)
Deep Learning Scientist Intern (Part-time)   Aug 2023 - Nov 2023

- Designed a multimodal attention-based model for diabetic foot ulcer healing prediction, combining multispectral imagery and clinical data. Achieved improved lesion localization.

Spectral AI   Dallas, TX
Deep Learning Scientist Intern   Jun 2023 - Aug 2023

- Enhanced a multimodal convolutional model for diabetic foot ulcer healing prediction, integrating multispectral imagery and clinical data. Improved classification accuracy by 8%.

PUBLICATIONS

1. **Karaman, B.K.**[†], Rawal, A., Ghavamzadeh, M., Shakiah S., Biswas, A., Zhou, R., "DISPO: Enhancing Training Efficiency and Stability in Reinforcement Learning for Large Language Model Mathematical Reasoning", submitted to AISTATS 2026.

2. **Karaman, B.K.**[‡], Zabir, I., Benhaim, A., Chaudhary V., Sabuncu, M.R., Song, X., "POROver: Improving Safety and Reducing Overrefusal in Large Language Models with Overgeneration and Preference Optimization", ICML 2025. [Paper]

3. Nguyen, M.[*], **Karaman, B.K.**[*], Kim, H.[*], Wang, A.Q.[*], Liu, F.[*], Sabuncu, M.R., "Knockout: A Simple Way to Handle Missing Inputs.", TMLR, 2025. [Paper]

4. **Karaman, B.K.**, Nguyen, M., Kim, H., Sabuncu, M.R., "A Deep Survival Model for Predicting Alzheimer's Diagnosis based on Multi-modal Longitudinal Data", accepted in IEEE BDMA, 2025.

5. **Karaman, B.K.**, Sabuncu, M.R., "Assessing the Significance of Longitudinal Data in Alzheimer's Disease Forecasting", AIiH 2024 (Best Paper Award). [Paper]

6. **Karaman, B.K.**, Dodelzon, K., Akar, G.B., Sabuncu, M.R., "Longitudinal Mammogram Risk Prediction.", MICCAI 2024. [Paper]

7. Kim, H., **Karaman, B.K.**, Zhao, Q., Wang, A.Q., Sabuncu, M.R., "Learning-based Inference of Longitudinal Image Changes: Applications in Embryo Development, Wound Healing, and Aging Brain", PNAS, 2024. [Paper]

8. Wang A.Q., **Karaman B.K.**, Kim H., Rosenthal J., Saluja R., Young S.I., Sabuncu M.R., "A Framework for Interpretability in Machine Learning for Medical Imaging", IEEE Access, 2023. [Paper]

9. **Karaman B.K.**, Mormino E.C., Sabuncu M.R., "Machine learning based multi-modal prediction of future decline toward Alzheimer's disease: An empirical study", PLoS ONE, 2022. [Paper] [Code] (Highlighted at Cornell Chronicle on Nov 23rd, 2022. [Article])

INVITED TALKS & SYMPOSIUMS

1. Distinguished speaker at the 6th Global Conclave on Neurology and Neurological Disorders (NEURO Conclave 2025): "Assessing the Significance of Longitudinal Data in Alzheimer's Disease Forecasting".

2. Distinguished speaker at the 5th International Conference on Future of Preventive Medicine and Public Health (Future of PMPH 2025): "Longitudinal Mammogram Risk Prediction".

3. Machine Learning in Medicine Symposium (MLIM 2022): "Machine learning based multi-modal prediction of future decline toward Alzheimer's Disease".

HONORS & AWARDS

– Best Paper Award, International Conference on AI in Healthcare (AIiH), 2024.

– Irwin Jacobs Scholar Fellowship, Cornell University, 2020.

– METU High Honor Award, based on graduation grades, METU, 2020.

– EEE STAR Award, given by the Electrical and Electronics Engineering Department at METU for participation in research, METU, 2019.

SERVICE

Cornell University   Ithaca, NY
Graduate Teaching Assistant   Jan 2021 - May 2021

– Mentored students for a term project about MRI registration.

– Held discussion sessions and office hours for the senior-level course ECE4250 Digital Signal and Image Processing.

[†]Work done during an internship at Amazon AGI.
[‡]Work done during an internship at Microsoft AI.
[*]Indicates equal contribution.