

# BATUHAN K. KARAMAN

🏠 New York, NY 10044

✉ [kbk46@cornell.edu](mailto:kbk46@cornell.edu) ☎ +1-607-229-9099

🌐 [batuhankmkaraman.github.io](https://batuhankmkaraman.github.io)

## ABOUT ME

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As a highly motivated scientist with experience in creating computational modeling and analytical tools for real-world data, I am a collaborative and independent learner with a strong interest in using machine learning to advance professional service technologies.

## EDUCATION

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### Cornell University

Ph.D. in Electrical and Computer Engineering

Advisor: Mert Sabuncu

Ithaca, NY

2020 - present

### Middle East Technical University

B.S. in Electrical and Electronics Engineering

Ankara, Turkey

2015 - 2020

## SKILLS

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### Languages

Python, R, C/C++, MATLAB

### Frameworks

PyTorch, Huggingface, Tensorflow, Keras, Scikit-Learn, SciPy, NetworkX, Pandas

### Statistical Analysis

Hypothesis testing, Data visualization

### Others

Azure, AWS, Linux, L<sup>A</sup>T<sub>E</sub>X

## EXPERIENCE

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### Cornell University

Graduate Research Assistant

Supervisors: Mert Sabuncu, Ray Razlighi (from Weill Cornell Medicine Radiology)

New York, NY

Sep 2020 - Present

- My PhD research develops deep learning methods for predicting clinical outcomes and analyzing longitudinal biomarkers in neurodegenerative and neoplastic diseases.

### Microsoft

Applied Scientist Intern

Supervisors: Xia Song, Alon Benhaim, Maggie Engler (previously at Inflection AI)

Redmond, WA

June 2024 - Aug 2024

- Improved safety and reduced overrefusal in large language models through instruction fine-tuning and preference optimization.
- Developed a novel preference optimization recipe, achieving a 30% reduction in model overrefusals.

### Spectral AI

Deep Learning Scientist Intern (Part-time)

Dallas, TX (Remote)

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

Deep Learning Scientist Intern

Dallas, TX

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%.

### Aselsan

Machine Learning Software Intern

Ankara, Turkey

May 2019 - Jul 2019

- Built a speaker recognition system with deep learning.

## PUBLICATIONS

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1. **Karaman, B.K.**<sup>†</sup>, 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”, submitted to ICLR 2025. [\[Paper\]](#)
2. Nguyen, M.\*, **Karaman, B.K.**\*, Kim, H.\*, Wang, A.Q.\*, Liu, F.\*, Sabuncu, M.R., “Knockout: A Simple Way to Handle Missing Inputs.”, submitted to ICLR 2025. [\[Paper\]](#)
3. **Karaman, B.K.**, Nguyen, M., Kim, H., Sabuncu, M.R., “Longitudinal Data’s Impact on Alzheimer’s Disease Prediction Accuracy”, submitted to IEEE BDMA, 2024.
4. 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”, submitted to PNAS, 2024.
5. **Karaman, B.K.**, Dodelzon, K., Akar, G.B., Sabuncu, M.R., “Longitudinal Mammogram Risk Prediction.”, MICCAI 2024. [\[Paper\]](#)
6. **Karaman, B.K.**, Sabuncu, M.R., “Assessing the Significance of Longitudinal Data in Alzheimer’s Disease Forecasting”, AIIH 2024 (Best Paper Award). [\[Paper\]](#)
7. 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, 2024. [\[Paper\]](#)
8. **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 23<sup>rd</sup>, 2022. [\[Article\]](#))

## INVITED TALKS & SYMPOSIUMS

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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 AND AWARDS

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- 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

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### Cornell University

Graduate Teaching Assistant

Ithaca, NY

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.

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<sup>†</sup>Work done during an internship at Microsoft.

\*Indicates equal contribution.