Bayazit Karaman

Associate Professor of Computer Science

Florida Polytechnic University

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EDUCATION

University of Arkansas at Little Rock **Aug. 2015 - May 2018**

- Doctor of Philosophy (PhD) in Information and Computer Science. (GPA: 4.0)
- Dissertation: The Role of Antipodal Connectivity Structure on Cognitive Functions and Mental Disorders

University of Arkansas at Little Rock **Aug. 2013 - May 2015**

- Master of Computer Science. (GPA: 4.0)
- Thesis: Modeling the Antipodal Connectivity Structure of Neural Communities

Istanbul Kultur University **Sept. 2007 - June 2012**

- Bachelor of Computer Engineering (GPA 3.15)
- Thesis: Secure In-Flight Object Recognition and Broadcasting

EMPLOYMENT

Florida Polytechnic University, Department of Computer Science **Aug. 2019 - Present**

- Associate Professor, (Aug. 2025 - Present)
- Assistant Professor, (Aug. 2019 - July 2025)

Hendrix College, Department of Mathematics and Computer Science **July 2018 - July 2019**

- Visiting Assistant Professor, (July 2018 - July 2019)

University of Arkansas at Little Rock, Department of Computer Science **Jan. 2014 - May 2018**

- Instructor, (Aug. 2017 - May 2018)
- Teaching Assistant, (Jan. 2014 - Dec. 2017)

Istanbul Kultur University, Department of Computer Engineering **Sep. 2012 - Aug. 2013**

- Teaching Assistant, (Sep. 2012 - Aug. 2013)

TEACHING

Graduate Courses (Florida Polytechnic University):

- CAP 5610 - Machine Learning Theory and Practice (Spring 24 and Spring 25)

Undergraduate Courses (Florida Polytechnic University):

- CAP 4612 - Machine Learning (Fall: 23, 24, 25)
- CAI 4304 - Natural Language Processing (Fall: 25, 26)
- CAP 4610 - Operating Systems Concepts (Fall: 25, 26)
- COP 3337 - Object Oriented Programming (Fall: 20, 21, 22, 23, 24, 26; Spring: 20, 21, 23, 24, 25)
- CDA 2108 - Fundamentals of Computer Systems (Fall: 19; Spring: 20, 22, 25)
- COP 3809 - Advanced Topics in Programming (Spring: 22, 23)
- COP 2041 - Python 2: Computational Methods and Applications (Fall: 23)
- COP 2034 - Introduction to Programming Using Python (Summer: 23)
- COP 4415 - Data Structures (Fall: 19, 20; Summer: 20)
- COP 3530 - Data Structures and Algorithms (Fall: 21)
- COP 2271 - Introduction to Computation and Programming (Fall: 20)

- ENG 1007 - Concepts and Methods for Engineering and Computer Science (Spring: 22)
- ENG 1006 - Career Design for STEM Disciplines (Fall: 21)

Undergraduate Courses (Hendrix College):

- CSCI 285 - Scientific Computing (Spring: 19)
- CSCI 370 - Interactive Game Development (Spring: 19)
- CSCI 150 - Foundations of Computer Science Lab (Spring: 19)
- CSCI 230 - Computing Systems Organization (Fall: 18)
- CSCI 151 - Data Structures with Lab (Fall: 18)
- CSCI 410 - Senior Seminar (Fall: 18)

Undergraduate Courses (Instructor, University of Arkansas at Little Rock):

- CPSC 1370 - Computer Literacy (Fall: 17; Spring: 18)

Undergraduate Courses (Teaching Assistant, University of Arkansas at Little Rock):

- CPSC 3482 - Computer Organization (Fall: 15, 16, 17)
- CPSC 3383 - Language Structure (Spring: 16)
- CPSC 3482 - Capstone Project (Spring: 15)
- CPSC 2382 - Computer Systems and Assembly Language (Fall: 14; Spring: 15)

Undergraduate Courses (Teaching Assistant, Istanbul Kultur University):

- CSE 2002 - Programming II (Spring: 13)
- CSE 4124 - Programming Language Concepts (Spring: 13)
- CSE 501 - Visual Programming (Fall: 12)

RESEARCH INTERESTS

Trustworthy and interpretable machine learning, with applications in computational neuroscience, neuroinformatics, biomedical data analysis, natural language processing, and computer vision. Current interests include graph and multimodal learning, and reproducible evaluation of AI systems.

PUBLICATIONS

- **Journals**
  Published:
  - **Karaman, Bayazit**. "Anatomical Information in Source-Conditioned Connectome Responses: Bounded Coordinate Decoding and Reference Placement." Neuroinformatics (2026), in press. https://doi.org/10.1007/s12021-026-09831-z.
  - **Karaman, Bayazit**. "Low-dimensional GPT-2 features improve cross-narrative prediction of shared fMRI responses." Journal of Neurolinguistics 81 (2027): 101381.
  - Demirel, Doga, Bryce Palmer, Gunnar Sundberg, **Bayazit Karaman**, Tansel Halic, Sinan Kockara, Nizamettin Kockara, Mark Edward Rogers, and Shahryar Ahmadi. "Scoring metrics for assessing skills in arthroscopic rotator cuff repair: performance comparison study of novice and expert surgeons." International journal of computer assisted radiology and surgery 17, no. 10 (2022): 1823-1835.
  - **Karaman, Bayazit**, R. Murat Demirer, Coskun Bayrak, and M. Mert Su. "Modeling the antipodal connectivity structure of neural communities." AIMS Neuroscience 3, no. 2 (2016): 163-180.
  - Arica, Nafiz, Anil Celik, **Bayazit Karaman**, Coskun Bayrak, and Onur Kececi. "Video Enhanced RFID Tracking System." International Journal of Applied Methods in Electronics and Computers 3, no. 4 (2015): 226-231.

  Submitted:
  - **Karaman, Bayazit**. "How final model fitting changes comparisons of random and scaffold validation in QSAR benchmarks." Submitted to *SAR and QSAR in Environmental Research*.

– **Karaman, Bayazit**. "Size-matched isotropic noise overestimates decoder portability across repeat structural connectomes." Submitted to *Neuroinformatics*.

In Preparation:

– Hossain, Sumaya, Parisa Hajibabaee, **Bayazit Karaman**, and the Alzheimer's Disease Neuroimaging Initiative. "Leakage-Aware Hybrid Graph Learning for Multiclass Alzheimer's Disease Classification with Verifier-Controlled Patient-Level Interpretation." Manuscript in preparation.

- **Conference Papers**
Published:

– Hossain, Sumaya, Bismack Tokoli, Tyler Mondalto, Parisa Hajibabaee, and **Bayazit Karaman**. "Grounded Patient-Level Narrative Generation for Alzheimer's Disease Using Multimodal Biomarkers." In *2026 IEEE International Systems Conference (SysCon)*, pp. 1–8. IEEE, 2026.

– **Karaman, Bayazit**, Benjamin Bowman, Laura N. Kloepper, and Ian Bentley. "Leveraging Pretrained ResNet Architectures for Enhanced Real-Time Bat Counting." In *2026 IEEE International Systems Conference (SysCon)*, pp. 1–6. IEEE, 2026.

– Bowman, Benjamin, Abdulaziz Alhamadani, Shailik Sarkar, and **Bayazit Karaman**. "CAEW: An explainable approach to understanding EEG patterns in major depressive disorder." in Proc. 13th IEEE Int. Conf. Big Data (IEEE BigData 2025), 2025, pp. 3207–3215.

– Bowman, Benjamin, Zhi Zheng, Nesreen Dalhy, Brendan Geary, Ian Bentley, and **Bayazit Karaman**. "Improving Object Counting Accuracy with Adaptive CNN Models and Meta-Level Routing." In *2025 IEEE World AI IoT Congress (AIIoT)*, pp. 84–92. IEEE, 2025.

– Razvan Ioan, Hogea, Tracy Olin, **Bayazit Karaman**, and Doga Demirel. "Augmented Reality Labs: Immersive Learning in Chemistry." In International Conference on Human-Computer Interaction, pp. 155-172. Cham: Springer Nature Switzerland, 2024.

– Toker, Onur, **Bayazit Karaman**, and Doga Demirel. "A Paper-Based Keyboard Using ArUco Codes: ArUco Keyboard." In International Conference on Human-Computer Interaction, pp. 195-208. Cham: Springer International Publishing, 2022.

– Dubs, Alexandra, Victoria Correa Andrade, Mark Ellis, Seth Ganley, **Bayazit Karaman**, and Onur Toker. "A Photo-Realistic Simulation and Test Platform for Autonomous Vehicles Research." In 7th North American International Conference on Industrial Engineering and Operations Management. 2022, https://doi.org/10.46254/NA07.20220424.

– Demirel, Doga, Abdelwahab Hamam, Caitlin Scott, **Bayazit Karaman**, Onur Toker, and Lyan Pena. "Towards a new chemistry learning platform with virtual reality and haptics." In International Conference on Human-Computer Interaction, pp. 253-267. Cham: Springer International Publishing, 2021.

– Sundberg, Gunnar, and **Bayazit Karaman**. "A Comprehensive COVID-19 Database for the United States." In 2021 Systems and Information Engineering Design Symposium (SIEDS), pp. 1-5. IEEE, 2021.

– **Karaman, Bayazit**, and Coskun Bayrak. "NAMS: An Environment for Visualization of Hidden Structures in Neural Activities." In SoutheastCon 2021, pp. 1-4. IEEE, 2021.

– Palmer, Bryce, Gunnar Sundberg, James Dials, **Bayazit Karaman**, Doga Demirel, Muhammad Abid, Tansel Halic, and Shahryar Ahmadi. "Arthroscopic Tool Classification using Deep Learning." In Proceedings of the 2020 the 4th International Conference on Information System and Data Mining, pp. 96-99. 2020.

Accepted:

– **Karaman, Bayazit**. "Riemann Stereographic Energy Coupling Reveals Motor-Imagery-Related Changes in Sensor-Space EEG Shared-Energy Density." Accepted for presentation at the *IEEE Signal Processing in Medicine and Biology Symposium (SPMB 2026)*.

In Preparation:

– **Karaman, Bayazit**. "Answer Presence Is Not Enough: Stress Testing Compact Evidence-Sufficiency Judges for Multi-Hop QA." Manuscript in preparation.

- **Abstracts (Posters)**
Published:

– Dubs, Alexandra, Victoria Correa Andrade, Mark Ellis, **Bayazit Karaman**, Doga Demirel, A. J. Alnaser, and Onur Toker. "Drive a vehicle by head movements: An advanced driver assistance system using facial landmarks and pose." In International Conference on Human-Computer Interaction, pp. 502-505. Cham: Springer International Publishing, 2022.

– Scott, Caitlin, Mohammad Ali, **Bayazit Karaman**. "Principal Component Analysis of G Protein Coupled Receptor

Activation." AAAS Annual Meeting, 2020.

– Ali, Mohammad, Caitlin Scott, **Bayazit Karaman**. "Analysis of protein data bank deposited GPCR conformations." Arkansas INBRE, 2018.

PROFESSIONAL SERVICES

- **Course Coordinator**, Object Oriented Programming **Jan. 2021 - July 2025**
  - Conduct weekly meetings with course instructors to ensure alignment and consistency.
  - Develop and distribute comprehensive course materials on Canvas, including lecture slides, sample code, course overviews, assignments, and quizzes.
  - Organize and lead the creation of common exams in collaboration with all instructors.
- **Chair**, Curriculum Committee **Aug. 2024 - July 2025**
  - Lead the development of a revised and modernized Computer Science curriculum.
  - Facilitate biweekly committee meetings to discuss progress and address challenges.
- **Member**, Faculty Search Committee **Aug. 2023 - July 2024**
  - Participate in weekly committee meetings to discuss recruitment strategies and candidate evaluations.
  - Review, evaluate, and rank applications for faculty positions.
  - Conduct interviews with prospective candidates and provide feedback.
- **Member**, Program Revision Committee **Aug. 2020 - Aug. 2021**
  - Collaborate on program revisions to align with ABET accreditation standards.
  - Contributed to the CLO (Course Learning Outcomes) Evaluation Document for the 2019-2020 and 2020-2021 academic years.
- **Member**, Curriculum Committee **Aug. 2021 - Aug. 2024**
  - Contributed to adapting the Computer Science curriculum using the Sequence Design model.
  - Worked in designing the joint concentration in Intelligent Mobility and Autonomous Systems.
  - Drafted a pre-proposal for a Bachelor of Science program in Health Informatics and Computational Biology.
- **Journal Reviewer**
  - *Cognitive Neurodynamics*
  - *Journal of Neuroscience Methods*
  - *Knowledge-Based Systems*

STUDENTS MENTORED

- **Undergraduate Internships**:
  - Supervised six undergraduate students in internships focused on deep learning, machine learning, and data analysis.
  - These efforts led to two conference presentations, a journal publication, and an abstract poster.
- **Undergraduate Thesis**:
  - Guided an undergraduate student on an individual thesis project, which resulted in two abstract poster presentations.
- **Capstone Project Supervision**:
  - Advised a capstone group project that received the Best Capstone Project Award for creating a realistic simulation and testing platform for autonomous vehicle research using deep learning and Unreal Engine.
  - This project led to one abstract poster and a conference paper publication.
- **Master's Thesis Supervision**:
  - Mentored a Master's student on thesis research involving telemedicine applications, deep learning architecture design, and generative AI.

- Mentored a Master's student on thesis research in interpretable Alzheimer's disease staging using Graph Neural Networks, temporal modeling, explainability, and natural language generation for clinically grounded summaries.
- This work resulted in one conference paper presentation, with one journal manuscript in preparation.

TECHNICAL SKILLS

- **Programming and Scripting:** C, C++, C#, Python, Java, SQL, MATLAB, R, JavaScript
- **Tools and Platforms:** AWS, Git, CI/CD, Docker
- **Machine Learning:** TensorFlow, Keras, scikit-learn, PyTorch
- **Data Analysis and Visualization:** Matplotlib, Pandas, Seaborn, Numpy

AWARDS and HONORS

- Best Capstone Project Award - Florida Polytechnic University, Advisor, 2022
- Outstanding PhD Publication Award - University of Arkansas at Little Rock, 2017
- First Place Winner at Student Research and Creative Works Expo - University of Arkansas at Little Rock, 2015
- Graduate School Travel Award - University of Arkansas at Little Rock, 2015
- Service Award - 4th International Symposium on Digital Forensics and Security ISDFS, University of Arkansas at Little Rock, 2016

REFERENCES

Available Upon Request