Abdullah Akgül PhD Candidate, Computer Science

I have been a computer and math geek since childhood, learning through curiosity and trial-and-error. Today, I am a machine learning researcher specializing in reinforcement learning, deep learning, and probabilistic modeling, with publications at top venues such as NeurIPS and ICLR. I am skilled in developing ML systems, collaborating across disciplines, and mentoring students and projects. I am a versatile researcher who can quickly adapt to new domains in machine learning.

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Education

2023-on	**PhD in Computer Science**, University of Southern Denmark, Odense, Denmark	
2020-2022	**MSc in Computer Engineering**, Istanbul Technical University, Istanbul, Turkey (GPA: 4.0/4.0)	
2015-2020	**BSc in Computer Engineering**, Istanbul Technical University, Istanbul, Turkey (GPA: 3.7/4.0)	

Work Experience

2023-on — Salaried PhD, Department of Mathematics and Computer Science, University of Southern Denmark
- Led reinforcement learning research, resulting in a NeurIPS 2024 paper and ongoing preprints.
- Collaborated with the Intelligent Autonomous Systems group at TU Darmstadt under Jan Peters, leading to a submission.
- Contributed to open-source codebases (e.g., MOMBO, ObjectRL) adopted by the research community.

2021-2023 — Research and Teaching Assistant, Artificial Intelligence and Data Science Engineering, Istanbul Technical University
- Conducted research in computer vision and uncertainty quantification, leading to a publication at ICLR 2022.

2020-2020 — Part-time Machine Learning Engineer, R&D and Innovation, Vakifbank
- Developed Siamese CNNs for fraud detection in signature verification.
- Achieved 95% test accuracy on internal data and 88% on CEDAR benchmark, reducing fraud risk.
- Applied various CNNs (MobileNetV2, ResNet50) using Keras/TensorFlow.

2019-2019 — Research Intern, Artificial Intelligence and Robotics Laboratory (AIRLab), Istanbul Technical University
- Built simulated robot manipulation environments in pyBullet for kitchen tasks.
- Implemented Deep Deterministic Policy Gradient (DDPG) and Soft Actor-Critic (SAC) for robotic control.
- Integrated pyBullet and MoveIt environments for inverse kinematics calculations.

2018-2018 — Front-End Developer, Dogus Technology, Istanbul, Turkey
- Built front-end web applications (JavaScript, Node.js) and back-office systems.
- Designed secure login pages, error-handling flows, and responsive user interfaces.
- Built an Arduino-based chatbot integrated with Slack for sensor-user interaction.

Publication Highlights

2024 — Deterministic Uncertainty Propagation for Improved Model-Based Offline Reinforcement Learning.
Akgül, A.; Haussmann, M; Kandemir, M. Advances in Neural Information Processing Systems.
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2025 — Overcoming Non-stationary Dynamics with Evidential Proximal Policy Optimization.
Akgül, A.; Baykal, G; Haussmann, M; Kandemir, M. arXiv preprint.
📄 PDF

2022 — Evidential Turing Processes.
Kandemir, M; **Akgül, A.**; Haussmann, M; Unal, G. International Conference on Learning Representations.
📄 PDF 🐙 aportekila/EvidentialTuringProcess ▶ Video 📊 Slides

2025 — ObjectRL: An Object-Oriented Reinforcement Learning Codebase.
Baykal, G; **Akgül, A.**; Haussmann, M; Tasdighi, B; Werge, N; Wu, Y.S; Kandemir, M. arXiv preprint.
📄 PDF 🐙 adinlab/objectrl 📋 Documentation

2024 — Continual Learning of Multi-modal Dynamics with External Memory.
Akgül, A.; Kandemir, M; Unal, G. Learning for Dynamics and Control Conference.
📄 PDF 🐙 aportekila/CDDP-Continual-Learning-of-Multi-modal-Dynamics-with-External-Memory

Technical Skills

</> Programming & Frameworks	Python, C, C++, PyTorch, TensorFlow, Keras, SQL, ROS	
◗ Machine Learning	Reinforcement Learning, Deep Learning, Probabilistic Modeling, Bayesian Inference, Computer Vision, Bandits, Federated Learning, Large Language Models	
⚙ Tools & Platforms	MATLAB, Git, Linux, LaTeX, Docker, Weights & Biases	
⊕ Languages	English (Fluent), Turkish (Native), Danish (Basic)	

Teaching & Mentorship

2023–on   **Teaching Assistant**, Department of Mathematics and Computer Science, University of Southern Denmark
- Delivered exercise sessions on core machine learning concepts; guided students through assignments and provided constructive feedback.
- Mentored 2+ MSc students on their theses, supporting research design and implementation.

2021–2023   **Research and Teaching Assistant**, Artificial Intelligence and Data Science Engineering, Istanbul Technical University
- Teaching Assistant for Python Programming, Probability & Statistics, and Computer Architecture courses.
- Supervised undergraduate students, enhancing their problem-solving and programming skills.
- Mentored 3+ BSc students on final projects, leading to 2 workshop papers at NeurIPS and ICLR.
- Mentored 1 MSc student on thesis work, resulting in a TMLR publication.

Conference Activities

2025   18th European Workshop on Reinforcement Learning (EWRL 2025), Tübingen, Germany

2025   Danish Digitalization, Data Science and AI (D3A 3.0), Nyborg, Denmark

2024   The Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS 2024), Vancouver, Canada

2024   Danish Digitalization, Data Science and AI (D3A 2.0), Nyborg, Denmark

2024   The Forty-first International Conference on Machine Learning (ICML 2024), Vienna, Austria

2024   6th Symposium on Advances in Approximate Bayesian Inference (AABI), Vienna, Austria

Academic Service

2025–on   **Reviewer**, Advances in Neural Information Processing Systems(NeurIPS)

2025–on   **Reviewer**, European Workshop on Reinforcement Learning (EWRL)

2025–on   **Reviewer**, IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)

2022–2023   **Reviewer**, IEEE Transactions on Neural Networks and Learning Systems (TNNLS)

Additional Publications

2024   **PAC-Bayesian Soft Actor-Critic Learning**.
Tasdighi, B; **Akgül, A.**; Haussmann, M; Brink, K.K; Kandemir, M. Advances in Approximate Bayesian Inference.
⬇ PDF ⊙ adinlab/PAC4SAC

2024   **Calibrating Bayesian UNet++ for Sub-Seasonal Forecasting**.
Asan, B; **Akgül, A.**; Unal, A; Kandemir, M; Unal, G. Tackling Climate Change with Machine Learning, ICLR.
⬇ PDF

2023   **BOF-UCB: A Bayesian-Optimistic Frequentist Algorithm for Non-Stationary Contextual Bandits**.
Werge, N; **Akgül, A.**; Kandemir, M. arXiv preprint.
⬇ PDF

2022   **How to Combine Variational Bayesian Networks in Federated Learning**.
Ozer, A; Buldu, K.B; **Akgül, A.**; Unal, G. Workshop on Federated Learning: Recent Advances and New Challenges, in Conjunction with NeurIPS.
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