Abdullah Akgül

Curriculum Vitæ Summary

Machine learning researcher with a strong publication record in reinforcement learning, deep learning, and probabilistic modeling. Focused on building ML systems that work beyond benchmarks, with experience developing open-source tools, solving real-world decision-making problems under uncertainty, and collaborating across disciplines. Quick to adapt to new domains.

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Education

- **Ph.D. in Computer Science** University of Southern Denmark, Odense, Denmark *Feb 2023 - (expected) Apr 2026*
- **M.Sc. in Computer Engineering** Istanbul Technical University, Istanbul, Turkey (GPA: 4.0/4.0) *Sep 2020 - Nov 2022*
- **B.Sc. in Computer Engineering** Istanbul Technical University, Istanbul, Turkey (GPA: 3.7/4.0) *Sep 2016 - Aug 2020*

Experience

- **Research Assistant - Postdoctoral Researcher** *Feb 2026 - Present*

  Department of Mathematics and Computer Science, University of Southern Denmark Odense, Denmark
  - Continuing research on probabilistic reinforcement learning for sample-efficient control.

- **Salaried Ph.D.** *Feb 2023 - Jan 2026*

  Department of Mathematics and Computer Science, University of Southern Denmark Odense, Denmark
  - Established a strong publication record in top-tier venues on improving sample efficiency in reinforcement learning.
  - Contributed to open-source codebases (e.g., MOMBO, EPPO, ObjectRL) adopted by the research community.
  - Delivered exercise sessions on core machine learning concepts; guided students through assignments and provided feedback.
  - Mentored 2+ MSc students on their theses, supporting research design and implementation.

- **Research and Teaching Assistant** *Mar 2021 - Jan 2023*

  Faculty of Computer and Informatics Engineering, Istanbul Technical University Istanbul, Turkey
  - Conducted research in computer vision and uncertainty quantification.
  - Teaching Assistant for Python Programming, Probability & Statistics, and Computer Architecture courses.
  - Mentored 1 MSc student on thesis work (resulting in a TMLR publication) and 3+ BSc students on final projects (leading to 2 workshop papers at NeurIPS and ICLR).

- **Part-time Machine Learning Engineer** *Aug 2020 - Sep 2020*

  R&D and Innovation, Vakifbank Istanbul, Turkey
  - Built a signature verification system for fraud detection using Siamese CNNs.
  - Achieved 95% test accuracy on internal data and 88% on the CEDAR benchmark.

- **Research Intern** *Aug 2019 - Sep 2019*

  Artificial Intelligence and Robotics Laboratory (AIRLab), Istanbul Technical University Istanbul, Turkey
  - Implemented deep reinforcement learning algorithms (DDPG, SAC) for robotic manipulation tasks.
  - Developed PyBullet simulation environments with MoveIt integration for inverse kinematics.

Technical Skills

Programming Languages: Python, C, C++, JavaScript, HTML/CSS
ML Frameworks & Libraries: PyTorch, TensorFlow, Keras, Scikit-learn, NumPy, SciPy, Pandas, OpenCV
Tools & Platforms: Git, Linux, Docker, ROS, MATLAB, LaTeX, Weights & Biases, Flask, Node.js
Languages: English (Fluent), Turkish (Native), Danish (Basic)
Areas of Interest: Reinforcement Learning, Deep Learning, Probabilistic Modeling, Bayesian Inference, Computer Vision, Large Language Models, Bandits, Federated Learning

Selected Publications

- **Deterministic Uncertainty Propagation for Improved Model-Based Offline Reinforcement Learning** *2024*

  Akgül, A., Haußmann, M., Kandemir, M., *Advances in Neural Information Processing Systems (NeurIPS).*
  - Addressed instability in model-based offline reinforcement learning by replacing Monte Carlo sampling with progressive moment matching, achieving up to 17% faster convergence and tightest uncertainty estimates across all 12 D4RL tasks with provably tighter suboptimality bounds.

- **Overcoming Non-stationary Dynamics with Evidential Proximal Policy Optimization** *2025*

  Akgül, A., Baykal, G., Haußmann, M., Kandemir, M., *Transactions on Machine Learning Research (TMLR).*
  - Integrated evidential learning with Proximal Policy Optimization (PPO) for robust adaptation to non-stationary dynamics, achieving up to 46% higher cumulative return and consistently outperforming all baselines across continuous control tasks with changing environment conditions.

•**Bridging the performance-gap between target-free and target-based reinforcement learning** *2025*

Vincent, T., . . ., **Akgül, A.**, . . ., Peters, J., D'Eramo, C., *International Conference on Learning Representations (ICLR).*

– Developed a hybrid target network approach, reducing memory footprint by up to 49%, surpassing target-based performance by 6% in online RL (Atari), closing the performance gap from 26% to 6% in offline RL, recovering full target-based performance in continuous control (DMC Hard), exceeding target-based results by 5% in language-based RL (Wordle), and improving learning speed by over 10% in streaming RL.

•**ObjectRL: An Object-Oriented Reinforcement Learning Codebase** *2025*

Baykal, G., **Akgül, A.**, Haußmann, M., Tasdighi, B., Werge, N., Wu, Y.S., Kandemir, M., *arXiv preprint.*

– Developed an open-source, object-oriented deep reinforcement learning codebase enabling rapid prototyping through modular class hierarchies, inheritance, and polymorphism.
– Released as an open-source pip-installable Python package with unit testing, continuous integration, comprehensive API documentation, and step-by-step tutorials.

•**Meta Continual Learning on Graphs with Experience Replay** *2023*

Unal, A., **Akgül, A.**, Kandemir, M., Unal, G., *Transactions on Machine Learning Research (TMLR).*

– Combined meta learning with experience replay for continual node classification on graphs, improving average performance by 10-80% across benchmark datasets (CiteSeer: 51.48%, Arxiv: 31.76%, Reddit: 67.66%) while reducing catastrophic forgetting by up to 78 percentage points.

•**Evidential Turing Processes** *2022*

Kandemir, M., **Akgül, A.**, Haußmann, M., Unal, G., *International Conference on Learning Representations (ICLR).*

– Addressed total uncertainty quantification by combining evidential learning with memory-augmented neural processes, achieving superior calibration with ECE of 2.6-2.7% across image datasets (reducing calibration error by 51-61% vs. BNN and 25-70% vs. EDL), while excelling at in-domain fit and out-of-domain rejection.

•The rest is available in Google Scholar: https://scholar.google.com/citations?user=FZeaKPoAAAAJ.

Academic Service

•**Reviewer** Advances in Neural Information Processing Systems (NeurIPS) *2025 - Present*

•**Reviewer** European Workshop on Reinforcement Learning (EWRL) *2025 - Present*

•**Reviewer** IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) *2025 - Present*

•**Reviewer** IEEE Transactions on Neural Networks and Learning Systems (TNNLS) *2022 - 2023*

References

Available upon request.