

Mohammad Mahdi Azarbeik

Ph.D. Candidate & Researcher – Offline Reinforcement Learning for Critical Care

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EDUCATION

Ph.D., Computer Science (Informatics) <i>Vienna University of Technology (TU Wien)</i>	2023 – Present <i>Vienna, Austria</i>
M.Sc., Mechanical Engineering <i>Sharif University of Technology (SUT)</i>	2020 – 2023 <i>Tehran, Iran</i>
B.Sc., Mechanical Engineering <i>K. N. Toosi University of Technology (KNTU)</i>	2016 – 2020 <i>Tehran, Iran</i>

RESEARCH INTERESTS

Clinical AI & Decision Support: Reinforcement Learning for Critical Care, Clinical Decision Support Systems, Off-Policy Evaluation
Machine Learning: Deep Reinforcement Learning, Generative AI, LLMs, Self-Supervised Learning
Biomedical Data: Physiological Time Series, Multi-Modal Clinical Data (EHR, Structured, Imaging), ICU Databases
Robotics: State Estimation, Data Fusion, Localization

SKILLS

Programming: Python, MATLAB, SQL, Linux (Ubuntu)
Clinical Data: MIMIC-IV, ViennaAIdb, ICU time series, physiological signal analysis, EHR feature engineering
Deep Learning & ML: PyTorch, TensorFlow, scikit-learn
Robotics: Sensor & Data Fusion, Kalman Filtering, ROS (Robot Operating System), Arduino IDE
Developer Tools: Git, Google Cloud Platform, BigQuery, MySQL, PostgreSQL
Misc.: Academic research, scientific writing, interdisciplinary clinical-computational collaboration, teaching

PUBLICATIONS

- [1] **M. M. Azarbeik**, L. Kapral, R. Weiss, C. Heitzinger, and O. Kimberger, “Learning and evaluating improved reinforcement learning-based policies for sepsis treatment on MIMIC-IV,” *Journal of Critical Care*, vol. 92, p. 155385, 2026. Conference abstract, ICCAI 2025.
- [2] L. Kapral, R. Bologheanu, **M. M. Azarbeik**, A. Bilir, R. Weiss, S. Bartos, S. Schaller, C. Heitzinger, E. Schaden, and O. Kimberger, “Optimized renal replacement therapy decisions in intensive care: A reinforcement learning approach.” Preprint, Research Square, Mar. 2025.
- [3] L. Kapral, **M. M. Azarbeik**, R. Weiss, R. Bologheanu, C. Heitzinger, and O. Kimberger, “Optimal timing for renal replacement therapy in critically ill patients using reinforcement learning algorithms,” *Journal of Critical Care*, vol. 86, p. 154964, 2025. Conference abstract, ICCAI 2024.
- [4] V. Arzt, **M. M. Azarbeik**, I. Lasy, T. Kerl, and G. Recski, “TU Wien at SemEval-2024 Task 6: Unifying model-agnostic and model-aware techniques for hallucination detection,” in *Proceedings of the 18th International Workshop on Semantic Evaluation (SemEval-2024)*, pp. 1183–1196, Association for Computational Linguistics, June 2024.
- [5] **M. M. Azarbeik**, H. Razavi, K. Merat, and H. Salarieh, “Augmenting inertial motion capture with SLAM using EKF and SRUKF data fusion algorithms,” *Measurement*, vol. 222, p. 113690, 2023.
- [6] A. Meghdari, S. M. J. Zolanvari, H. Izanlo, M. S. Tohidi Nafe, **M. M. Azarbeik**, *et al.*, “An overview of the design experience and group analysis of a spinning ride from the perspective of engineering education,” *Iranian Journal of Engineering Education*, vol. 24, no. 94, pp. 39–60, 2022.

EXPERIENCE

Researcher <i>Medical University of Vienna – Dept. of Anaesthesia, Intensive Care Medicine and Pain Medicine</i>	Jul. 2025 – Present <i>Vienna, Austria</i>
- Developing and validating deep reinforcement learning agents for decision support in intensive care. - Applying robust off-policy evaluation methods to assess clinical AI policy performance in offline settings. - Collaborating with intensive care physicians to ensure clinical plausibility of AI-driven treatment recommendations.	

Researcher

Feb. 2025 – Apr. 2026

Ludwig Boltzmann Institute for Digital Health and Patient Safety (LBI DHPS)

Vienna, Austria

- Lead researcher for LBI DHPS on the Horizon Europe project EU-TRAINS: “Towards an Ecosystem of User-centric devices and services for multisport Training and Remote healthcare enabled by an Artificial Intelligence-based Network of Sensors.”

University Assistant

Oct. 2023 – Jan. 2025

Vienna University of Technology (TU Wien)

Vienna, Austria

- Conducted research on offline reinforcement learning for clinical decision support; implemented deep RL pipelines in PyTorch on large-scale ICU databases.
- Designed and benchmarked multi-method off-policy evaluation frameworks for medical RL.
- Co-developed hallucination detection methods for large language model outputs (SemEval-2024 Task 6; ranked 3rd in the model-aware track).

Teaching Assistant

- Reinforcement Learning, *Vienna University of Technology (TU Wien)*
- Generative AI, *Vienna University of Technology (TU Wien)*
- Data-oriented Programming Paradigms, *Vienna University of Technology (TU Wien)*
- Numerical Analysis, *K. N. Toosi University of Technology (KNTU)*

PEER REVIEW

Reviewer for *PLOS Digital Health*, *Measurement*, *Journal of Intelligent & Robotic Systems*, and *IEEE Sensors Journal*.