Alper Demir

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CONTACT INFORMATION	İzmir University of Economics, Department of Computer Engineering, A209	+90-232-488-8286 alper.demir@ieu.edu.tr

RESEARCH INTERESTS

Machine Learning, Reinforcement Learning, Multi-Agent Reinforcement Learning

EDUCATION

Middle East Technical University (METU), Ankara, Turkey

Ph.D., Computer Engineering, November 2019
- Topic: *Improving Reinforcement Learning using Distinctive Clues from the Environment*
- CGPA: 3.93 / 4.00
- Advisor: Prof. Dr. Faruk Polat , Co-Advisor: Dr. Erkin Çilden

M.Sc., Computer Engineering, August 2016
- GPA: 3.79 / 4.00
- Topic: *Effective Subgoal Discovery and Option Generation in Reinforcement Learning*
- Advisor: Prof. Dr. Faruk Polat

B.Sc., Computer Engineering, June 2014
- GPA: 3.36 / 4.00, HONOR 7 Semesters, HIGH HONOR 1 Semester
- Erasmus Program : Wrocław Uni. of Technology, Wrocław, Poland, 2013

ACADEMIC EXPERIENCE

Assistant Prof. February 2020 - ...
Department of Computer Engineering, Izmir University of Economics

Postdoctoral Researcher August 2024 - August 2025
Autonomous Agents Research Group, University of Edinburgh

Research & Teaching Assistant September 2014 - November 2019
Department of Computer Engineering, Middle East Technical University
Supervisor: Prof. Dr. Faruk Polat, Co-Supervisor: Dr. Erkin Çilden

INDUSTRY EXPERIENCE

Software Developer, BTT Inc., METU Technopolis 2013-2014
- Developing applications on Android
- Involving in Web Development

Intern, Turkish Aerospace Industries (TAI) Summer 2012
- Working with senior developers in designing and developing software tools
- Writing tests for Human Machine Interface partition

PROJECTS

- *Solving Asymmetric Social Dilemmas in Multi-Agent Reinforcement Learning with Local Information*,
Scientific and Technological Research Council of Turkey (TÜBİTAK),
International Postdoctoral Research Fellowship Program for Turkish Citizens,
2024 - 2025, Edinburgh, United Kingdom

- *Forming Useful Memory in Partially Observable Reinforcement Learning*,
Scientific and Technological Research Council of Turkey (TÜBİTAK),
Grant No: 120E427, 2021 - 2023, İzmir, Turkey

- *Yök Program Ve Kontenjan Yönetim Sistemi (Yök Pkys)*,
Scientific and Technological Research Council of Turkey (TÜBİTAK),
Grant No: 115G086, 2018 - 2019, Ankara, Turkey

- *Subgoal Identification in Sequential Decision Making under Partial Observability*,
Scientific and Technological Research Council of Turkey (TÜBİTAK),
Grant No: 215E250, 2016 - 2018, Ankara, Turkey

1. Demir, A., Çilden, E. & Polat, F. *A history tree heuristic to generate better initiation sets for options in reinforcement learning* in *Proceedings of the Twenty-second European Conference on Artificial Intelligence (ECAI)* (2016), 1644–1645. doi:`10.3233/978-1-61499-672-9-1644`.

2. Demir, A., Çilden, E. & Polat, F. *Local roots: A tree-based subgoal discovery method to accelerate reinforcement learning* in *Joint European Conference on Machine Learning and Knowledge Discovery in Databases (ECML/PKDD)* (2016), 361–376. doi:`10.1007/978-3-319-46227-1_23`.

3. Demir, A., Çilden, E. & Polat, F. *A Concept Filtering Approach for Diverse Density to Discover Subgoals in Reinforcement Learning* in *2017 IEEE 29th International Conference on Tools with Artificial Intelligence (ICTAI)* (2017), 1–5. doi:`10.1109/ICTAI.2017.00012`.

4. Demir, A., Çilden, E. & Polat, F. Generating Effective Initiation Sets for Subgoal-Driven Options. *Advances in Complex Systems* **22.** doi:`10.1142/S0219525919500012` (2019).

5. Demir, A., Çilden, E. & Polat, F. *Landmark Based Reward Shaping in Reinforcement Learning with Hidden States* in *Proceedings of the 18th International Conference on Autonomous Agents and MultiAgent Systems* (Int. Foundation for Autonomous Agents and Multiagent Systems, 2019), 1922–1924. ISBN: 978-1-4503-6309-9. <`http://dl.acm.org/citation.cfm?id=3306127.3331964`>.

6. Demir, A., Çilden, E. & Polat, F. Automatic landmark discovery for learning agents under partial observability. *The Knowledge Engineering Review* **34.** doi:`10.1017/S026988891900002X` (2019).

7. Demir, A., Çilden, E. & Polat, F. Landmark based guidance for reinforcement learning agents under partial observability. *International Journal of Machine Learning and Cybernetics,* 1–21 (2022).

8. Dilek, İ., Oğuz, K. & Demir, A. *Behaviour Analysis of Izmir Residents Using Public Wi-Fi Access Point Usage* in *2022 3rd International Informatics and Software Engineering Conference (IISEC)* (2022), 1–6.

9. Demir, A. Learning what to memorize: Using intrinsic motivation to form useful memory in partially observable reinforcement learning. *Applied Intelligence,* 1–19 (2023).

10. Başoğul, A. O., Çekirdek, H., Nakipoğlu, K., Yağcı, S. & Demir, A. *Analyzing Traffic Patterns in Izmir: A Study on Busy Hours and Congestion* in *2024 Innovations in Intelligent Systems and Applications Conference (ASYU)* (2024), 1–6.

11. Arslan, A., Titiz, İ. E., Gürcan, E. C. & Demir, A. *Water Consumption Dynamics in Izmir: Analyzing Influences of District, Seasonality, and External Events* in *2024 Innovations in Intelligent Systems and Applications Conference (ASYU)* (2024), 1–6.

12. Çakır, M. T., Nayir, H., Demir, A., Kaya, H. & Ceylan, O. *A reinforcement learning based approach to solve voltage issues in distribution networks* in *2025 IEEE 19th International Conference on Compatibility, Power Electronics and Power Engineering (CPE-POWERENG)* (2025), 1–6.

ACADEMIC
SERVICE

Conference Reviewing

Association for the Advancement of Artificial Intelligence (2022)

European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (2021, 2022)

International Informatics and Software Engineering Conference (2022)

Multi-disciplinary Conference on Reinforcement Learning and Decision Making (2025)

Journal Reviewing

Applied Intelligence (2023, 2024)

Artificial Intelligence Review (2024)

International Journal of Machine Learning and Cybernetics (2024)

Artificial Intelligence Communications (2024)

Knowledge-based Systems (2024)

Machine Learning (2024)

REFERENCES

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STM Defense Technologies Engineering and Trade Inc.
Ankara, Turkey

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Department of Computer Engineering, Middle East Technical University
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Assoc. Prof. Dr. Yusuf Sahillioğlu,   ys@ceng.metu.edu.tr
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