BERKAY DEMIREL

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Latest version

PERSONAL STATEMENT

Artificial Intelligence Researcher with 3+ years of experience in implementing, researching, and improving the latest reinforcement learning algorithms with deep-learning architectures using the industry standard tools, seeking a full-time data scientist role with an emphasis on applied research.

EXPERIENCE

Predoctoral Researcher   Sept. 2019 - Present
Artificial Intelligence and Machine Learning (AI-ML) Group, Universitat Pompeu Fabra   *Barcelona, Spain*

I fulfill multiple roles in the lab besides running my own research projects. The roles and corresponding responsibilities I hold can be summarized as the researcher, the lab technician, and the research manager. Some of my achievements in each of these roles include:

- Development and maintenance of a reinforcement learning module in Python, which serves as the main research platform for the lab and shortens research iteration times considerably.
- Correlation and causation analysis, and modeling of motor and sensory signals of artificial robot arms.
- Development of a novel causal inference measure called Acceleration Transfer, and comparing it against Granger Causality and Transfer Entropy.
- Development of deep Q-network architectures using PyTorch to compare against classical planning algorithms in a policy generalization task.
- Concurrent management of multiple graduate students to advance a line of research leading to multiple publications to support an important research milestone.

Research Assistant   Jun. 2018 - Sept. 2019
Artificial Intelligence and Machine Learning (AI-ML) Group, Universitat Pompeu Fabra   *Barcelona, Spain*

Being the first research assistant to my advisor, I worked on multiple projects:

- Development and comparison of multiple deep-learning architectures with Tensorflow for Q-value estimation to understand the role of perception in artificial agent policy.
- Analyzing the effects of increasing the node size of small-world networks on Integrated Information measure (ϕ).
- Development of a multi-platform 3D robot theatre application using Unity 3D and C# as a part of the robotic theatre project called Teatronika.

EDUCATION

Doctor of Philosophy in Information and Communications Technologies 2019 - 2023
Universitat Pompeu Fabra *Barcelona, Spain*

Master's Degree in Cognitive Systems and Interactive Media 2017 - 2019
Universitat Pompeu Fabra *Barcelona, Spain*

Bachelor's Degree in Psychology, 2013 - 2017
Maltepe University *Istanbul, Turkey*

PUBLICATIONS

- Demirel, B., Solé R. V., Sánchez-Fibla, M. **Policy-Sharing as a Multi-Agent Environmental Adaptation Mechanism.** In Process.
- Demirel, B., Sánchez-Fibla, M. **Understanding Multi-Scale Successor Representation Agents.** In Review.
- Demirel, B., Moulin-Frier, C., Arsiwalla, X. D., Verschure, P. F., Sánchez-Fibla, M. (2021). **Distinguishing Self, Other, and Autonomy From Visual Feedback: A Combined Correlation and Acceleration Transfer Analysis.** Frontiers in Human Neuroscience, 443. DOI: 10.3389/fnhum.2021.560657
- Platt, S., Demirel, B., Oliver, M. (2021). **Using Transition Learning to Enhance Mobile-Controlled Handover In Decentralized Future Networks.** In IEEE 4th 5G World Forum (5GWF) (pp. 424-429). IEEE.DOI: 10.1109/5GWF52925.2021.00081
- Demirel, B., Sánchez-Fibla, M. (2019). **Speeding up reinforcement learning by combining attention and agency features.** In Artificial Intelligence Research and Development: Proceedings of the 22nd International Conference of the Catalan Association for Artificial Intelligence (Vol. 319, p. 84). IOS Press. DOI: 10.3233/FAIA190111
- Demirel, B., Senel, G., Arsiwalla, X. D., Verschure, P. F. **Integrated Information, Small World Networks, and Size Effects.** In Human Brain Project Conference on Understanding Consciousness: A scientific quest for the 21st century.

SKILLS & INTERESTS

Technical Skills: Python and standard ML modules including PyTorch, Tensorflow, Keras, Pandas, SciPy, NumPy, Sci-Kit Learn, Jupyter Notebooks, Matplotlib, Seaborn. R, SQL, Git, Unity 3D, and C# for Unity, LaTeX, Office, and Google Suite.

Soft Skills: Effective communication, presentation, and leadership skills developed by years of tutoring and academic advisory roles, remote working experience, volunteer work, various pieces of training, and living/studying in different countries.

Languages: English (C2), Turkish (C2), German (B2), Spanish (B1)

Memberships: Cognitive Science Society Member, Maltepe University Technology and Human Relationships Application and Research Center Advisory Board Member

Interests and Hobbies: Camping, scuba-diving, Krav Maga, Dungeons & Dragons, reading science fiction short stories