BERKAY DEMIREL

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Latest version

PERSONAL STATEMENT

Experienced Machine Learning Engineer with 5+ years in AI, adept in developing and optimizing a range of machine learning models. Skilled in applying deep learning techniques and leveraging industry-standard tools to create impactful AI solutions across various domains.

EXPERIENCE

Artificial Intelligence Engineer May 2023 - Present
Quantic Brains *Madrid, Spain*

- Led the end-to-end design and launch of two AI-driven products, integrating multiple machine learning models (reinforcement learning, supervised learning, and LLMs), resulting in the first-in-market products in the entertainment industry.
- Developed, trained and deployed custom machine learning models using multi-agent reinforcement learning and supervised learning algorithms with PyTorch on Google Cloud Platforms.

Predoctoral Researcher Sept. 2019 - May 2023
Artificial Intelligence and Machine Learning (AI-ML) Group, Universitat Pompeu Fabra *Barcelona, Spain*

In the lab, I have successfully assumed multiple roles and responsibilities, such as:

- Developed a Python-based reinforcement learning module to streamline research processes, substantially minimizing research iteration periods.
- Performed advanced statistical analysis and modeling for motor and sensory signals in artificial robot arms, enhancing our understanding of robotic motion and control.
- Utilized supervised and unsupervised learning techniques to refine dimensionality reduction, efficiently analyze intricate mixed data sets, and uncover valuable insights.
- Innovated a unique causal inference metric called Acceleration Transfer, and conducted comparative analyses against established benchmarks such as Granger Causality and Transfer Entropy.
- Explored policy generalization tasks and potential improvements by creating and evaluating deep Q-network architectures using PyTorch alongside traditional planning algorithms.

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

- Developed and benchmarked various custom deep reinforcement learning architectures using Tensorflow.
- Investigated the effects of increased node size on Integrated Information measure (ϕ) within small-world graph networks.
- Designed, developed and successfully deployed across multiple platforms a 3D robot theatre application using C# for Unity3D as a part of the innovative robotic theatre project, Teatronika.

EDUCATION

Doctor of Philosophy in Information and Communications Technologies 2019 - Present
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. (2023). **Policy-Sharing as a Multi-Agent Environmental Adaptation Mechanism.** In Process.
- Demirel, B., Freire, I. T., Sánchez-Fibla, M. (2023). **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. (2018). **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, Statsmodels, Jupyter Notebooks, Matplotlib, Seaborn. R, OpenCV, NLTK, SQL, PySpark, Git, Google Cloud Platform, 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, Artificial Intelligence Doctoral Academy Member, American Psychological Association International 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