BERKAY DEMIREL

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Latest version

PERSONAL STATEMENT

Dedicated Machine Learning Engineer with over 5 years of experience in AI, specializing in developing and optimizing machine learning models and deep learning architectures for impactful AI solutions in diverse domains.

EXPERIENCE

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

- Led the design and launch of two market-first AI-driven products in entertainment, integrating reinforcement learning, generative AI, and LLMs, and deployed custom models with PyTorch on Google Cloud Platform.
- Developed a custom pipeline integrating retrieval augmented and constrained generation with LLMs, boosting data processing efficiency and enhancing model precision and contextual relevance.

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

- Developed a Python-based reinforcement learning module to streamline research processes, minimizing research iteration periods.
- Enhanced robotic motion analysis through advanced statistical modeling of motor and sensory signals, and innovated in causal inference with 'Acceleration Transfer', conducting comparative analyses with benchmarks like Granger Causality and Transfer Entropy.
- Leveraged supervised and unsupervised learning for advanced problem-solving, focusing on dimensionality reduction, model optimization, and enhancing RL agent performance.
- Explored policy generalization through the development and evaluation of 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 (ϕ) within graph networks.
- Designed, developed and launched 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. (2024). **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