Joshua Shay Kricheli

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Occupational Experience

Neuro-Symbolic AI Research Associate   **Tempe, Arizona, USA**
V2 Lab, Arizona State University (ASU)   *2023-Present*

- Conducting research in the frontier theoretical field of Neuro-Symbolic AI, a Computer Science methodology fusing deep learning with explainable rigorous logic and demonstrating applications of the novel methods to several Computer Vision (CV) and Natural Language Processing NLP (NLP) use cases
- Supervising a team of three graduate and undergraduate students from the lab in a project focused on applying a proposed Neuro-Symbolic method to metacognitive error detection of an ML model, via learning detection and correction rules to approximate solutions maximizing the performance of the model using sub-modular set optimization, resulting in an accepted paper after peer review at CIKM 2024 in Boise, Idaho, USA, with an acceptance rate of 22%/100%
- Developed an open-source Python package called *PyEDCR*, implementing the method suggested in the article
- Main methodologies used: Deep Learning, Transformers and Vision Transformers, Embedding Generation, Formal Logic, Knowledge Representation, Rule Learning, Information Retrieval, Combinatorial and Continuous Optimization

Vice President Data Science   **Tel Aviv, Israel**
Frenn Analytics   *2022*

- Founding the Data Science department at the start-up company focusing on HR-Tech and Sales-Ops in its early stages
- Built and showcased to investors a post-seed funding Proof-of-Concept ML pipeline for incorporating employee in-house data to improve compensations models and Sales-Ops intelligence, for improved corporate functionality
- Leveraging ML decision models and big data modalities to construct an AI-driven platform providing customized insights to increase win rates, shorten sales cycles and align GTM efforts
- Hiring and managing a team of entry-level data scientists from top US universities for data analysis, website maintenance and designated preliminary inference improvement research

AI/ML Research Associate and Teaching Assistant   **Beer Sheva, Israel**
Ben-Gurion University of the Negev (BGU)   *2019-2023*

- Researching with a team of six members from Mechanical Engineering, Computer Science, and Software Engineering as part of co-founding Prof. Gera Weiss' interdisciplinary lab, dealing with Robotics, Dynamical Systems, Optimal Control, Multi-Objective Optimization, Game Theory, Formal Logic, Automata Theory and Software Engineering
- Authoring and presenting a peer-reviewed paper at *MED 2021*, an international control and robotics conference
- Developed a novel, open-source Python package called *PyDiffGame*, implementing the method suggested in the article
- Submitted a research thesis on the main two novel contributions done in the lab - a novel method for compositional handling of competing control tasks using differential games, as well as a novel method of solving a set of Matrix Algebraic Ricatti Equation by converting them into a set of piece-wise Matrix Differential Ricatti Equations
- Acting Teaching Assistant at CS undergraduate courses; *Intro to Computer Science* and *Principles of Programming Languages* for two consecutive years

Data Scientist   **Beer Sheva, Israel**
Dell Technologies   *2019-2022*

- Working with a diverse team of data scientists, consultants and engineers mainly from the USA and Europe
- Worked on a Jira tickets duplication use case implemented by evaluating similarities between possible candidates tickets
- Developing more than 20 data science pipelines used to implement, manage and display results of data science projects
- Implemented full ML pipelines for a plethora of use cases, such as: Time Series modeling, Explanatory Data Analysis (EDA), WordCloud generation, Topic Modeling, ChatBot deployment, Video Transcription, Question Answering, Graphical Organization Modeling, Churn Prediction and other management and HR tools for in-comapny use
- Coding mostly using Python with packages such as PyTorch, TensorFlow, NumPy, Polars, Pandas, SciPy and scikit-learn

Computer Chips Manufacturing Process Engineer   **Kiryat Gat, Israel**
Intel Corporation   *2018-2019*

- Monitoring Intel's intricate chip manufacturing procedures using statistical methodologies, time series analysis and predictive methods to analyze system functionality and identify possible undesired disturbances
- Detecting design and process anomalies, analyzing performance metrics, predicting functional deficiencies and possible failures, issuing and escalating maintenance tickets and validating their implementation for resumed functionality

Sales Agent (2011 - 2012), Sales Manager (2012-2013) **Ramat Gan, Israel**
Visa C.A.L. (Israeli Credit Card Company) *2011 - 2013*
- Issuing and approving personal and business customer loans, ranked the top salesman of 2011 and 2012
- Managing a sales team of 15 salesmen and women, providing a lucrative and efficient working environment to meet sales goals

Education

2023-2027 - Philosophy Doctor (Ph.D.), Computer Science **Arizona State University, Tempe, Arizona, USA**
Neuro-Symbolic AI V2 Lab, advised by Prof. Paulo Shakarian *Current GPA: 4.0/4.0, Expected graduation in 2027*
2019-2022 - Master of Science (M.Sc.), Computer Science **Ben-Gurion University of the Negev, Israel**
AI Major, advised by Prof. Gera Weiss and Prof. Shai Arogeti *Graduated, GPA: 92.26/100, Thesis grade: 94/100*
2018-2019 - Computer Science M.Sc. Admission Prerequisites Program **Ben-Gurion University of the Negev, Israel**
Program of core undergraduate courses assigned by the graduate program committee *Graduated, GPA: 84.5/100*
2014-2018 - Bachelor of Science (B.Sc.), Mechanical Engineering **Ben-Gurion University of the Negev, Israel**
Control Systems, Mechatronics and Robotics Major *Graduated, GPA: 84.74/100, Senior GPA: 89.52/100*

Publications, Preprints and Projects

Conference Article, 1st Author; ACM CIKM 2024, Boise, Idaho, USA
Error Detection and Constraint Recovery in Hierarchical Multi-Label Classification without Prior Knowledge *2024*
Joshua Shay Kricheli, Khoa Vo, Aniruddha Datta, Spencer Ozgur and Paulo Shakarian
Journal Article, 1st Author; IEEE Transactions on Control Systems Technology - Under Review
Differential Games for Modular Handling of Competing Control Objectives *2024*
Joshua Shay Kricheli, Aviran Sadon, Shai Arogeti and Gera Weiss
Computer Science M.Sc. Thesis
Differential Games for Compositional Handling of Competing Control Tasks *2022*
Conference Article, 1st Author; IEEE MED 2021, Bari, Italy
Composition of Dynamic Control Objectives Based on Differential Games *2021*
Joshua Shay Kricheli, Aviran Sadon, Shai Arogeti, Shimon Regev and Gera Weiss
B.Sc. Final Engineering Project - Awarded A Certificate of Excellence
SNIC Bifurcation and its Application to MEMS, advised by Dr. Oriel Shoshani *2018*

Selected Fellowships, Scholarships, Affiliations and Awards

Ph.D. Galileo Project Affiliate, Center for Astrophysics, Harvard University
Employing AI in the systematic scientific search for evidence of extraterrestrial technological artifacts *2024-Present*
Ph.D. IEEE Eta Kappa Nu (HKN) Engineering Honor Society
ASU Epsilon Beta Chapter of the IEEE honor society for outstanding accomplishments students *2024-Present*
Ph.D. 'Global Security Initiative' 4-Year Fellowship
Fellowship for security-focused research improving capabilities for high-profile US national security *2023-Present*
M.Sc. Israeli National Science Foundation (NSF) Grant
Science research grant for academic research teams who contributed outstanding novel work *2023*
M.Sc. 'Israel Data Science Initiative' & German 'Helmholtz Data Science Academy' Funded Exchange Program
Deep learning research at 'Deutsches Zentrum für Luft und Raumfahrt' (DLR) - German Aerospace Center *2022*
M.Sc. 'Israeli Smart Transportation Research Center' ('ISTRC') Excellence Scholarship
Technion and Bar-Ilan program with Israel's prime minister's office and council for higher education *2020-2021*
M.Sc. 'Agricultural, Biological and Cognitive' ('ABC') Robotics 2-Year Fellowship
BGU fellowship for innovative robotics masters research students admitted as teaching assistants *2019-2021*
B.Sc. 'Education for Excellence' 1-Year Fellowship
Israeli foundation for educating unequally represented children toward academic and personal excellence *2015-2016*
B.Sc. 'Israel Scholarship Education Foundation' ('ISEF') 3-Year Fellowship
Academic excellence and leadership fellowship funded by investors from the United States *2014-2017*
B.Sc. Tel-Aviv University (TAU) 4-Year Excellence Scholarship
Excellence in engineering academic scholarship granted by Tel-Aviv University, Israel *2014-2018*
B.Sc. Israeli Ministry of Education 2-Year Scholarship
Excellent students funding program issued by the education ministry office of the Israeli government *2014-2016*