Jacob Dineen

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Contact Information

jacob[dot]dineen[at]asu[dot]edu | (480)603-6994 | jacobdineen.com

Research Interests

My research focuses on artificial intelligence, particularly reasoning and alignment in large language models (LLMs). I am also interested in eXplainable Artificial Intelligence (XAI), Graph Machine Learning, and Game Theory. My work aims to drive value by developing practical AI solutions that address real-world challenges and enhance decision-making processes.

Education

Arizona State University — *Present*
Ph.D. in Artificial Intelligence (GPA: 4.00/4.00)
Advisor: Prof. Ben Zhou

University of Virginia — *2019-2021*
M.Sc. in Computer Science (GPA: 3.96/4.00)
Advisor: Prof. Madhav Marathe

Syracuse University — *2017-2018*
M.S. in Data Science (GPA: 4.00/4.00)

Grand Canyon University — *2012-2015*
B.S. Finance and Economics (GPA: 3.65/4.00)

Research

Research Assistant @ *Arizona State University* — *Present*
- LLM Research @ AI Reasoning & Cognition (ARC) Lab
- Cybersecurity Research @ SEFCOM

Applied Research @ *Capital One* — *2020-2021*
- Explored aspects of organization dynamics under a reinforcement learning setting. Implemented an agent-based modeling system to study managerial incentive structures on experimental program optimization.

Research Assistant @ the *University of Virginia* — *2019-2020*
- Worked in the Biocomplexity Institute and Initiative labs with a focus on graph dynamic systems and cooperative game theory/behavior modeling, under the supervision of Professor Madhav Marathe.

Publications

Jacob Dineen, Donald Kridel, David Castillo, and Dan Dolk "Unified Explanations in Machine Learning Models: A Perturbation Approach". In Proceedings of the 56th Hawaii International Conference on System Sciences. — HICSS 2023

Dineen J., Haque A.S.M.AU., Bielskas M. (2021) Formal Methods for an Iterated Volunteer's Dilemma. In: Thomson R., Hussain M.N., Dancy C., Pyke A. (eds) Social, Cultural, and Behavioral Modeling. SBP-BRiMS 2021. — SBP-BRiMS 2021

Dineen J., Haque A.S.M.AU., Bielskas M. (2021) Reinforcement Learning for Data Poisoning on Graph Neural Networks. In: Thomson R., Hussain M.N., Dancy C., Pyke A. (eds) Social, Cultural, and Behavioral Modeling. SBP-BRiMS 2021. — SBP-BRiMS 2021

Dolk, D., Kridel, D., Dineen, J., & Castillo, D. (2020, January). Model Interpretation and Explainability towards Creating Transparency in Prediction Models. In Proceedings of the 53rd Hawaii International Conference on System Sciences — HICSS 2020

Professional Experience

Machine Learning Engineer @ *Spring Oaks Capital* *'22-'23*

- Developed and deployed scalable ETL and modeling pipelines using Airflow and Kubernetes for text/call efforts and offer generation, incorporating ranking recommendations and constrained optimization solutions to scheduling problems.
- Implemented robust CI/CD processes including tests, automated builds, and deployments utilizing AWS ECR, CodeBuild, and GitHub Actions, ensuring seamless and efficient workflow.
- Assisted wrt to cloud infrastructure for the core technology stack, from containerization to resource provisioning and development environments, optimizing performance and scalability.
- Prepared and maintained comprehensive Sigma dashboards and Streamlit apps to monitor online performance metrics, providing key stakeholders with actionable insights and facilitating data-driven decision-making.

Data Scientist @ *Capital One* *'21–'22*

- Engineered and productionalized critical updates to the core codebase, impacting 30MM+ users, through advanced feature engineering, robust data pipelines, unit tests, and custom model architectures.
- Developed sequential recommendation POCs utilizing PyTorch, Huggingface, and Nvidia's Merlin/Transformers4Rec. These innovations were showcased at the Nvidia GTC Fall Summit 2022.
- Co-led and designed a bi-weekly lecture series on Deep Learning and Neural Recommendation, fostering knowledge sharing and upskilling within the team.

Ph.D. Internships @ *Capital One (2X Data Science, 1X Applied Research)* *'20-'21*

- Researched and implemented state-of-the-art neural recommendation solutions for ad tech challenges, significantly improving ad targeting and engagement.
- Developed scalable and extensible data pipelines in PySpark, leveraging novel data sources to enhance model performance and insights.
- Provided strategic insights and recommendations for integrating neural solutions into production environments, extending the impact of summer projects.
- Conducted advanced research in agent-based modeling and reinforcement learning, contributing to the Center for Machine Learning (C4ML).

Analyst and Business Intelligence @ *Real World Marketing* *'16-'19*

- Designed and automated interactive dashboards and ad hoc reports, driving data-driven decision-making and improving operational efficiency.
- Integrated and analyzed diverse data sources, using statistical techniques to uncover actionable insights and optimize marketing strategies.
- Conducted multivariate analysis and A/B testing, significantly improving site conversion rates and marketing ROI.

Data Scientist @ *Buffalo Check LLC* *'15-'19*

- Cofounded and scaled a successful LLC, delivering innovative advertising solutions to the US military and generating over $2M in revenue.
- Performed detailed quantitative analysis on user engagement, enhancing advertising effectiveness and client satisfaction.

Optimization Analyst @ *Voltari* *'12-'15*

- Conducted analysis centered around first and second-click ad performance. Analysis concerning pricing strategy/optimization. Managed point of interest (POI) database via SQL.

Graduate Courses

Computer Systems Security, Software Security, Planning and Learning Methods in AI, Algorithms & Research/Dissertation Hours — *ASU*

Algorithms, Machine Learning, Computer Vision, Formal Methods, Reinforcement Learning, Graph Mining, Learning Theory (Game Theory), Cloud Computing & Research Hours — *UVa*

	Data Analysis and Decision Making, Business Analytics, Financial Analytics, Marketing Analytics, Advanced Information Systems, Data Science, Data Warehousing, Text Mining, Scripting for Data Analysis, and Information Policy	*Syracuse*

Skills

OS	Linux (Ubuntu), MacOS, Windows
Language	Python, Rust, x86-64, Java, JS, R, C, C++, PRISM, Bash, Vue, React
Database	MySQL, SQLite, NoSQL, MongoDB, Snowflake, Redshift, Postgres, Redis
Markup	LaTex, HTML
ML Library	PyTorch, Keras, Tensorflow, Jax, Numpy, Pandas, Polars, Dask, NLTK, Networkx, SparkML, SnowparkML, DeepGraphLibrary, HuggingFace, Botorch, Torch Geometric, Burn
Other	Weka, Mallet, Conda/Mamba, VSCode, Git, Databricks, Docker, Snowflake Snowpark, Airflow, AWS (ECR/S3/EKS/Codebuild), Kubernetes, Helm, Sigma, Sagemaker, OR-Tools, Click, Streamlit

Misc.

Expert AI Trainer	pareto.ai (‘24-present)
Tutor/TA	CGCC Calculus and Linear Algebra Tutor (‘19) ASU CSE365 (pwncollege) TA
Conference Reviewer	HICSS (‘21 & ‘22), SBP-BRiMS ‘21
Cyber Security (Certificate)	Pwn.college green belt (user: jdin) (‘22). Reverse engineering, binary exploitation, dynamic and static analysis

References

Paul Hurlocker	CTO @ Spring Oaks Capital LLC
David Der	Sr. Engineering Mngr. @ Spring Oaks Capital LLC
David Weiss	Sr. Engineering Mngr. @ Spring Oaks Capital LLC
Austin Cathon	Sr. AI & DS Mngr. @ Spring Oaks Capital LLC
Scott Golder	Sr. Director Data Science @ Capital One
Kalaland Mishra	Sr. Mngr. Data Science @ Capital One
Kerry Levenberg	Mngr. Data Science @ Capital One
Hailey Nguyen	Machine Learning Engineer @ Meta
David Castillo	CTO @ Voltari
Don Kridel	DS/AI Consultant @ Voltari