Joseph Spagnoli

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Education

University of Florida | Gainesville **Aug. 2023 – May 2027**
Bachelor of Science in Computer Science, Minors: Electrical Engineering, Statistics **GPA: 4.0**
Certificates in AI Fundamentals and Applications and Data Analytics

Experience

Undergraduate Researcher **May 2025 – Present**
Machine Learning and Sensing Lab (GatorSense) | University of Florida

- Developing machine learning algorithms for real-world agricultural applications, utilizing hyperspectral imagery for plant science and classification tasks.
- Investigating and applying multiple-instance learning approaches to estimate key agricultural metrics, such as nitrogen levels, from spectral data.

AI Scholars Researcher **Oct. 2024 – Present**
M.E. Rinker, Sr. School of Construction Management | University of Florida

- Developed a CTGAN synthesizer using SDV and Python, generating synthetic datasets with high fidelity to improve artificial neural network training accuracy.
- Investigated key physiological and environmental variables, such as cognitive function and core body temperature, to enhance predictive models for heat-related illnesses in construction workers.
- Contributed to the design of an ANN framework for real-time heat strain prediction, paving the way for IoT integration in wearable devices to improve workplace safety and reduce health risks.

First Year Florida Peer Leader **Dec. 2023 – Present**
Division of Student Life | University of Florida

- Demonstrated leadership in collaboration with a faculty co-instructor to develop a comprehensive syllabus and 14 detailed lesson plans, ensuring alignment with course objectives and university standards.
- Utilized strong time management and planning skills to organize 20 assignments and activities, creating a structured and supportive learning environment for 25 new university students.

Projects

EvoChess | Python **Mar. 2025 – Apr. 2025**

- Trained a Convolutional Neural Network on over 80,000 chess games to predict the next best move from a given board state.
- Processed and transformed chess game data into structured matrices, enhancing both model training and move prediction accuracy.
- Integrated the model with an interactive chess board using Pygame and python-chess for real-time gameplay, with plans to incorporate a genetic algorithm to further refine its strategic nuances.

Six Degress of Twitter | C++ / Crow & React **Mar. 2025 – Apr. 2025**

- Designed and implemented a C++ adjacency list and traversal system for BFS and A* algorithms to explore six degrees of separation in large-scale social network graphs.
- Built a Crow-based HTTP server exposing /path and /stats endpoints, returning JSON responses for graph metrics and pathfinding queries using a heuristic based on shared features.
- Collaborated on integration with a React/TypeScript frontend that visualizes connections and compares traversal methods through an interactive, force-directed graph interface.

Data-Driven Resource Optimization | Python **Jul. 2024 – Aug. 2024**

- Developed custom gradient descent algorithm to minimize the errors squared cost function, ensuring effective optimization for predicting event resource needs.
- Visualized cost function progression using Matplotlib to validate proper optimization and assessed model performance by calculating MAE, MSE, and R^2 scores with Scikit-learn, ensuring reliable predictions through comprehensive evaluation metrics.
- Integrated model forecasts into event logistics, driving a 20% reduction in resource costs and an 85% decrease in waste by matching supply orders precisely to predicted attendance from presale data

Skills and Achievements

Languages: Python, C++, R, Java, SQL, JavaScript **Tools**: Jupyter Labs, Git, PowerBI, MySQL, VS Code

Libraries/Frameworks: Scikit-learn, PyTorch, Pandas, NumPy, Matplotlib, Seaborn, TensorFlow, SDV, React, TypeScript

Relevant Coursework: AI Fundamentals, Intro to Machine Learning, Intro to Software Engineering, Data Structures and Algorithms, Programming with Data in R, Engineering Statistics, Differential Equations

Awards: AI Scholar (2025–2026), UF President's Honor Roll (2025–Present), Machen Florida Opportunity Scholar (2023)

Soft Skills: Communication, Collaboration, Problem-Solving, Critical Thinking, Adaptability, Time Management, Organization, Attention to Detail, Leadership & Mentoring, Conflict Resolution