LEA BRODY-HEINE

lea_brody-heine@alumni.brown.edu | AI/ML & Full Stack Software Engineer | **MSc**
Personal Website | LinkedIn | GitHub

EDUCATION

University of St Andrews, Scotland
MSc Computer Science, Concentration in AI
GPA: First Class Honors
Graduated: 2024

Brown University, Providence, RI
Bachelor of Arts
GPA: 4.0
Graduated: 2023

TECHNICAL SKILLS

Programming Languages: Python, Java, JavaScript, C++, HTML, CSS, SQL

Full Stack Development: Node.js, Express, Vue.js, React, Angular, RESTful APIs, MongoDB, MySQL, D3.js, Database Management (Relational and NoSQL), Firebase

Machine Learning & AI: pandas, scikit-learn, TensorFlow, PyTorch, Keras, CNN, GAN, Data Pipelines

Tools: Git, GitHub, Docker, Containers, Jupyter Notebook, Tableau

Methodologies: Object-Oriented Programming, Agile, Scrum, Microservices, Pair Programming, User-centric Design, CI/CD

MASTER'S DISSERTATION

Machine Learning for Pathology in Mast Cell Diseases Jan 2024 – Aug 2024
University of St Andrews

- Constructed machine learning models to analyze tabular data and intestinal biopsy stains for mast cell disease research, employing generative AI to augment data and improve model training.
- Reduced processing time by 60% by leveraging a GPU PC, Docker, and containers to efficiently process complex programs.
- Increased detection accuracy by 25% by employing YOLO v8 and computer vision techniques to identify and count mast cells, spindle-shaped mast cells, and clusters in biopsy images.
- Enhanced research capabilities by augmenting over 200,000 data points (both tabular and image).
- Managed version control through GitHub to ensure reproducibility and collaborative development.
- Facilitated further research and reduced study time by 30% by designing user-friendly tools that employ both supervised and unsupervised models, allowing researchers and clinicians to input data to derive meaningful insights and discoveries and accelerate time to diagnosis.

EXPERIENCE & PROJECTS

Software Engineer May 2024 – Aug 2024
GSI Water Solutions, Inc | Internship *Bend, OR*

- Increased client follow-up efficiency by 70% by developing a calendar and email alert system, and automating renewal reminders.
- Enhanced team operations by designing and launching a full-stack solution and integrating with existing infrastructure for timely notifications.
- Managed a codebase of over 10,000 lines and improved system reliability through iterative testing, feedback sessions, and secure access controls.
- Coordinated the product lifecycle from requirements gathering to deployment, ensuring timely delivery as the sole developer.

Agile Methodology Sept 2023 – Nov 2023
Collaborative Project

- Facilitated the end-to-end development of a software product as Scrum Master, guiding a cross-functional team through Agile methodologies to improve team efficiency by 30%.
- Ensured a user-centric design by coordinating between user requirements and the development team, driving project success and user satisfaction.
- Implemented Jira for tracking task progress and managing sprints, adapting to changing requirements and priorities to ensure timely delivery of iterative feature enhancements.

Artificial Intelligence & Machine Learning Development Jan 2024 – May 2024
Projects

- Engineered 5 logical agents using LogicNG and SAT4J Java libraries, implementing advanced strategies (SPS, SATS, PROBS) to solve complex decision-making problems.
- Developed and optimized a machine learning model for forecasting water pump status in Tanzania, achieving over 90% in prediction accuracy by leveraging scikit-learn, pandas, numpy, and Optuna for hyperparameter tuning.
- Implemented AI search algorithms for a flight route planner, optimizing pathfinding through DFS, BFS, A*, and SMA* algorithms, reducing search time by 35% using Euclidean distance heuristics.
- Built and fine-tuned machine learning models to predict flight disruptions on a large-scale Kaggle dataset, enhancing model performance through data cleaning, feature engineering, and classifier optimization in Python and Jupyter Notebook.
- Delivered actionable insights by developing multiclass classification models for predicting cirrhosis patient outcomes, focusing on data imputation and handling unbalanced datasets, resulting in a 15% improvement in prediction accuracy.

Full Stack Web Development Jan 2024 – May 2024
Projects

- Produced a full stack web application with over 5,000 lines of code using a NoSQL database (MongoDB) and Node.js, Express, and Vue.js.
- Integrated RESTful APIs for API endpoints, optimized database management, and designed a full stack system architecture.
- Built a single-page web application for trivia quizzes, implementing 20+ interactive features using JavaScript, HTML, and CSS, enabling real-time question fetching and score tracking.

Game Development Mar 2023 – Apr 2024
Projects

- Designed and implemented a Java-based game backend system with over 3,000 lines of code, ensuring reliable game mechanics, HTTP server functionality, and efficient JSON communication for real-time gameplay.
- Constructed an online multiplayer game using JavaScript, Node.js, and Express, integrating RESTful APIs to manage player interactions and game state synchronization.
- Designed the front end for "Superhero Escape" focusing on user-friendly interfaces and seamless gameplay experience.