

LEA BRODY-HEINE

lea_brody-heine@alumni.brown.edu | Software Engineer | MSc
[Personal Website](#) | [LinkedIn](#) | [GitHub](#)

EDUCATION

Brown University BA
GPA: 4.0

Providence, RI
Graduated: 05/23

University of St Andrews MSc Computer Science
GPA: First Class Honors with Distinction | Dean's List

St Andrews, Scotland
Graduated: 09/24

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, Deep Learning, LLMs, 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

01/24 – 08/24

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.

WORK EXPERIENCE

Full Stack Web Developer

09/24 – 10/24

AIM Executive Coaching | Paid Independent Contract

Remote

- Built a fully functional and responsive website, using HTML, CSS, JavaScript, and HubSpot.
- Increased discoverability by 21% as measured by SEO performance, by implementing SEO best practices, optimizing load times, and developing for mobile, iPad, and desktop users.
- Collaborated closely with the client to ensure alignment with wireframe specifications and user engagement goals, adapting design to reflect client feedback for a more personalized experience.

Software Engineer Intern

05/24 – 08/24

GSI Water Solutions, Inc. | Part-Time Unpaid

Bend, OR

- Increased client follow-up efficiency by 36% 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.

ACADEMIC PROJECTS

AI & ML Development

01/24 – 05/24

Personal & Collaborative 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 93% 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.
- 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

01/24 – 05/24

Personal & Collaborative 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.

Agile Methodology

09/23 – 11/23

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.