Indrajeet Aditya Roy

Boston, MA | 2672699650 | indrajeet.aditya.roy@gmail.com | www.linkedin.com/in/indrajeet-aditya-roy | www.indrajeetroyportfolio.com

Education

Northeastern University | **M.S. Computer Engineering (AI & ML)** | **GPA: 3.89** | *September 2023 - May 2025*
- *Coursework: Machine Learning, Deep Learning, Reinforcement Learning, Natural Language Processing, Unsupervised Data Mining, LLM-based Dialogue Agents, Data Visualization, Parallel Data Processing, Applied Probability and Stochastic Processes*

Iowa State University | **B.S. Software Engineering** | **GPA: 3.7** | *August 2018 - May 2022*
- *Coursework: Data Structures and Algorithms, Distributed Systems, DBMS, Object-Oriented Design, Large Scale Data Analysis, Software Architecture*

Technical Skills

- **Languages:** *Java, Python, GraphQL, R, Ruby, Elixir, Javascript, Typescript, HTML, HTML.ERB, CSS, C, C++*
- **Python Libraries:** *Pandas, Numpy, Matplotlib, Seaborn, Plotly, NetworkX, statsmodels, Scrapy, Beautiful Soup, Requests*
- **ML Frameworks/Libraries:** *Keras, Tensorflow, PyTorch, Scikit-learn, Scipy, SpaCy, NLTK, Hugging Face transformers*
- **Web Frameworks/Libraries:** *Ruby Rails, Elixir Phoenix, Django, Flask, FastAPI, React, Axios, Apollo, Redux, Redux-toolkit, Next.js, Node.js*
- **DBMS:** *Relational (MySQL, PostgreSQL), NoSQL (DynamoDB, Cassandra, Neo4j, Redis)*
- **Data Tools/Frameworks:** *Apache Spark, Apache Hadoop, Apache Kafka*
- **Tools:** *Git, Docker, Datadog, Bugsnag, Prometheus, Grafana*
- **Cloud Tools/Services:** *Algolia, AWS (EMR, MKS, EC2, DynamoDB, RDS, S3), Terraform*

Projects & Research (www.indrajeetroyportfolio.com)

- **Mitigation techniques against deanonymization and DOS Attacks in Decentralized Networks**

Analysis of attack vectors and Tor network architecture vulnerabilities focusing on deanonymization and Denial-of-Service (DoS) attacks in decentralized networks and mitigating strategies to safeguard anonymity and maintain network integrity.

- **Enhancing Research Paper Summarization Through Language Abstractive Methods, LLM Fine-tuning and RAG**

Enhancement of academic journal summarization precision and comprehension by integrating language model fine-tuning methodologies such as Parameter-Efficient Fine-Tuning (PEFT) and Low-Rank Adaptation (LoRA) with Retrieval-Augmented Generation (RAG).

- **Reinforcement Learning Approach for Complex Maze Navigation and Spatial Decision Making**

Implemented Q-Learning, SARSA, and Actor-Critic Reinforcement Learning algorithm based agents using PyTorch for complex environment navigation, evaluating algorithm performance in achieving optimal outcomes under specific environment conditions and different reward functions.

- **Stock Behavior and Volatility Prediction**

Implemented K-Means Clustering on S&P 500 stocks dataset to segment weekly returns and utilized GARCH and SVM-GARCH models to forecast stock volatility, enhancing predictive accuracy and market trend analysis.

- **Network behavior anomaly detection**

Developed a FNN model using the BETH dataset on simulated network traffic logs, achieving a validation accuracy of 85%. Implemented StandardScaler for data normalization, optimized with Adam, and utilized sequential binary classification to effectively identify malicious activities.

Work Experience

Software Engineering Intern | Amwell | *June 2024 - August 2024* | Boston, MA
- Integrated the Validic platform with the Amwell Conversa health platform enabling synchronization of health monitoring device data with automated user healthcare programs, enhancing user engagement through data-driven personalization and analytics.
- Developed API services in Ruby to interface with the Validic REST API enabling user profile operations and device management functionalities.
- Developed API services in Ruby to interface with the Validic Inform Streaming API, handling Server Sent Events for processing device data streams.
- Utilized AWS DynamoDB for persistent data storage and Apache Spark for processing large datasets and data events, ensuring all user devices data is structured, ordered and accessible through a REST Ruby Rails API.

Software Engineer | The RealReal | *June 2022 – May 2023* | San Francisco, CA
- Refactored and migrated The RealReal web platform from legacy Elixir Phoenix implementation to a React ecosystem improving usability, Lighthouse score and web performance metrics using Redux, Axios/Apollo, Next.js, Jest and Webpack.
- Developed migration system in Ruby and Elixir for transitioning the engineering organization's feature flag management platform from legacy LaunchDarkly implementation to Harness, achieving vendor cost reductions and streamlining platform migration.
- Developed ETL tools to automate incremental data migration, implementing data integrity checks that validate new feature flag configurations against legacy platform configurations using JSON schema validation and Github Actions CI testing in LaunchDarkly and Harness environments.
- Supported implementation of internal engineering data platform Customer 360, developed ETL pipelines in Ruby and Elixir, integrated Kafka for multi-source data streaming and utilized AWS RDS for data storage resulting in a centralized aggregated data source for analytics and ML.

Software Engineering Intern | The RealReal | *June 2021 – August 2021* | San Francisco, CA
- Supported the Get Paid Now user program implementation and developed a configuration platform in Ruby and Elixir, extending administrative control for user programs through tracking and setup of configuration rules and integrations.
- Utilized AWS Postgres RDS for persistent data storage and developed CRUD services providing structured ordered data access through a REST Ruby Rails API and GraphQL Elixir API; enhanced data access performance with Redis caching, and implemented a Kafka messaging system using a scalable producer-consumer pub-sub model for data state tracking and updates across distributed systems.

Software Engineering Intern | Carlin Fit | *May 2020 – August 2020* | West Chester, PA
- Developed Android companion app to interface with the UV light hardware device component of the Purple-Bug UV ride-share cleaning product, utilizing Java/Kotlin, Retrofit, Glide, Room, RxJava, and Coroutines.