Rishik Sarkar

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Education

Rutgers University-New Brunswick — New Brunswick, NJ
Bachelor of Science in Computer Science, Cognitive Science — *Sep 2020 – (May 2024)*

- GPA: 3.88/4.00
- Honors: SAS Honors Program, Phi Beta Kappa, SAS Dean's List (Every Semester)

Experience

Full-Stack Developer Intern — Jun 2023 – Present
Provenir — *Parsippany, NJ*

- Implemented Decision Trees, Random Forests, XGBoost, and RNNs into FLAML using **scikit-learn** and **TensorFlow** for automated model training and deployment with AutoML; tuned hyperparameters and added monotonic constraints to elevate average model accuracy up to 95%
- Integrated artifact, SHAP, and LIME plot generation capabilities, enabling deep insights into model behavior and resulting in an improved UX; improved API endpoints for log retrieval and model architecture PDF export
- Implemented over 100 unit tests using **MockMvc** and demoed deployment with **Minikube** to ensure robust performance and early issue detection

ML Research Intern — May 2022 – Jun 2022
Abraira Lab — *New Brunswick, NJ*

- Employed **Motion Sequencing** to preprocess and create a dataset of over 10,000 high-quality training samples for an unsupervised ML model in a Computational Neuroethology observation study
- Analyzed behavioral syllables identified by the model and rectified anomalous keypoint results: leading to a 60% improvement in data quality

Projects

Invasion of the Bot-Grabbers | *Python, Jupyter, Pandas, PyTorch, Matplotlib* — Sep 2023 – Present

- Developed an automatic crew rescue bot grid maze simulation for a graduate-level course
- Implemented search algorithms including A* and D* Lite to facilitate the bot's path-finding through the maze
- Enhanced the bot's decision-making by integrating Bayesian networks; utilized sensors to determine optimal paths to crew members probabilistically while avoiding moving obstacle aliens
- Trained two logistic regression models to predict the bot's moves and win probabilities in the third iteration, incorporating features engineered from the probability matrices calculated earlier, enhancing efficiency
- Advanced the bot's performance further by implementing reinforcement learning with PyTorch, using an ACTOR-CRITIC framework

Tch.ai | *Next.js, Tailwind, Flask, Keras, OpenCV, Pandas, MySQL* — Apr 2023 – Jul 2023

- Innovated a full-stack web application to deploy a **Keras** image classifier and tokenizer that recommend songs based on mood predictions from facial expressions or textual data
- Trained the classification model on the **FER-2013** dataset and utilized **OpenCV** and a Haar Cascade classifier to preprocess datasets: achieving a training accuracy of around 96% and a validation accuracy of over 70%
- Designed a **Next.js**/**Tailwind** frontend that supports three genre selection methods–image, text, and manual
- Crafted a **Flask** REST API backend for image data preprocessing, providing personalized playlists from a CSV of 114,000+ songs, fine-tuned using genre, mode, valence, and other features
- Integrated a remote **MySQL** database, allowing users to create accounts and manage liked songs

UniDB | *MySQL, Java, Python, JDBC, Beautiful Soup, Requests, Jupyter* — Mar 2023 – Apr 2023

- Compiled data for 100 students by scraping course details from Rutgers University sites using **Beautiful Soup**
- Constructed a **MySQL** database with simulated student data, including majors, minors, credits, and schedules from 250+ scraped classes
- Developed a Java application using **JDBC** to offer users a selection of 10 preconfigured and custom queries

Technical Skills

Programming Languages: Python, Java, C++, C, JavaScript, HTML, CSS, SQL, MATLAB
Frameworks: TensorFlow, Kubernetes, Docker, Spring, OpenCV, Flask, Beautiful Soup, Next.js, Tailwind
Libraries/Platforms: Git, Jira, Jupyter, Pandas, Keras, scikit-learn, AWS, JavaFX, RDBMS, NoSQL, JDBC
Natural Languages: English (Native), Bengali (Native), Hindi (Advanced), Japanese (Intermediate)