Predrag Muratovic

905-308-2822
pmuratov1015@gmail.com
github.com/Pedja-Djape

Education

University of Toronto
Engineering Science: Machine Intelligence — Toronto ON, Sept 2018 - April 2023

Relevant Coureswork: Data Structures and Algorithms, Systems Software, Distributed Systems, Software Engineering, Introduction to Databases, Introduction to Machine Learning.

Experience

Data Scientist
Centre for Management of Technology & Entrepreneurship — Toronto ON, Sept 2022 - April 2023

- Collaborated with a Canadian financial institution to research and implement Deep Federated Learning techniques for my undergraduate thesis.
- Conducted exploratory data analysis on public large-scale customer transaction data using Pandas and Matplotlib, identifying patterns to inform data preprocessing and model selection.
- Developed a Federated Learning System leveraging Flower, a federated learning framework, and PyTorch to implement a vertically-split Split Neural Network for classification.
- Conducted feature engineering by extracting RFM (Recency, Frequency, Monetary) characteristics from one-year's worth of transactional data of 300,000 customers to generate training datasets.
- Achieved a competitive performance score on a Kaggle competition, demonstrating the effectiveness of the proposed approach for classification model.

Machine Learning Engineer
Perimeter MedAI & University of Toronto — Toronto ON, Sept 2022 - Dec 2022

- Designed and implemented two deep neural network architectures, DnCNN and UNet, for removing noise from medical imaging scans using PyTorch.
- Analyzed the characteristics of the noise distribution in the internal dataset and used this analysis to augment the dataset, resulting in a 35-fold increase in size.
- Trained the models and achieved a 9.7% and 11.8% increase in mean signal-to-noise ratio for the DnCNN and UNet models, respectively, without loss of tissue structure.

Infrastructure Developer (Site Reliability Engineer Intern)
Loblaw Companies Limited: Loblaw Technology — Toronto ON, May 2021 - Aug 2022

- Developed a configuration management web application using Flask, HTML, and JavaScript that greatly automated and accelerated the deployment of legacy applications to 1000s of store locations, saving time and resources.
- Implemented a custom Python library for automating the creation of Google Cloud Platform resources through Terraform, leading to a 50% reduction in development time.
- Created integrated Terraform IaC modules for GCP and MongoDB infrastructure provisioning for **20+** microservices.
- Designed and implemented CI/CD pipelines for deploying cloud applications to Kubernetes cluster, ensuring effiecient and relible software delivery.
- Collaborated with developers to ensure environment-specific requirements were met, working closely with development teams to integrate deployment scripts, testing tools, and monitoring solutions.

Projects

Distributed Storage Service
- Developed a distributed key-value storage service in Java, enabling users to store, retrieve, and update data across multiple nodes in a network.
- Implemented multi-threading, replication, and socket communication to enable efficient and scalable processing of user requests, high availability and fault tolerance of stored data
- Utilized Zookeeper for server heartbeats and failover handling, and designed a command-line interface for simple user-interaction.

Medical Research Search Engine
- Designed and developed a medical search engine using React.js for the frontend and Node.js (Express.js) to serve the application, providing users with an intuitive search experience.
- Leveraged the NCBI API to fetch relevant documents for queries, optimizing the search engine's retrieval of data and faclitating the development of a dynamic and interactive user-interface.

NBA Shotcharts Application
- Built a data-driven NBA shotchart application using Flask, with an API that offered multiple endpoints to retrieve player/team shooting data.
- Developed a dynamic user interface in React.js that allowed users to create hex-plot and/or standard zonal shotchats, and compare the shooting ability of different players.

Technical Skills
- **Programming:** Git, Python, JavaScript, Java, C, PostgreSQL, HTML, CSS.
- **Cloud & CI/CD:** Google Cloud Platform, GitLab CI/CD, & Terraform.
- **Machine Learning:** Federated Learning, PyTorch, Scikit-Learn, Pandas, & Computer Vision
- **Frameworks:** Flask, React.js, Express.js, & Node.js