

Merna Alghannam

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Education

Bachelor of Arts (B.A.) in Computer Science, 3.95/4.0, summa cum lauda

Jan 2020-Jan 2024

Relevant Coursework: Social Science, Data Science, Data Structures and Algorithm Analysis, Probability & Statistics, Machine Learning, Software Engineering, Linear Algebra.

Skills

Advanced (★★★★☆): Python, HTML, CSS, JavaScript

Intermediate (★★★☆☆): TypeScript, Web Development, SQL, Git, Java, C, Cloud Computing, Machine Learning, Distributed Systems, TensorFlow, R Programming, .NET Framework, JavaScript, C#, Microsoft SQL

Familiar (★★☆☆☆): Statistical Programming in Python, Data Analysis, Amazon Web Services (AWS), Google Cloud Platform (GCS), Jenkins, Jira, GitHub, Apache Spark, A/B Testing, Node.JS, Unity, React.JS, C++, Linux Operating System

Work Experience

Cybersecurity Analyst

Aramco

Jan 2024–Present

- Member of the Data Security within the Information Protection Department.
- **Awarded 1st place in the STEP competition** for developing a safety-compliance platform for plants and refineries using React, Node.js, and MongoDB. Built an 89%-accuracy computer-vision model to detect PPE compliance and integrated an LLM powered by plant manuscripts to enable reliable, hallucination-free smart search with document retrieval.
- **Lead Developer** for two in-house, patented data-leakage prevention platforms (Antileaks and Gatekeeper), responsible for ongoing maintenance, system health monitoring, and feature enhancements using .NET, C#, SQL Server, and PowerShell; improved Antileaks performance by 70%.
- Building an internal tool securing private LLMs by enforcing data masking/encryption and detecting prompt-injection, leakage, and sensitive-data reconstruction.

Skills: Network Security, Project Management, Data protection, Linux, Cryptography, AI Security, .NET Framework, JavaScript, C#, Microsoft SQL, PowerShell scripting, Symantec DLP

Undergraduate Research Assistant, Part-time – Quantitative Psychology Lab

Boston University, Boston, MA

June 2023–June 2024

- Developing a statistical method designed to assist psychological research, specifically in scenarios where datasets contain numerous outliers.

Skills: R Programming language, post-hoc statistical methods, Statistical Programming

Software Engineer Intern- ML and Backend Tools

Snapchat Inc., New York City, NY

Jun 2022–Sept 2022

- Enhanced user interactions on the Explorer page by developing a new label for the model, resulting in a more than 12% improvement in A/B metrics. Deployed the model into production using Agile methodology.
- Analyzed the significance of a new retrieval method for Snapchat's Explorer model using SQL, Google Big Query, and statistical methods.
- Loaded features from Snapchat's data aggregation platform into Google Big Query using a Kubernetes indexing job, reducing costs by 3% and improving performance.
- Developed an interactive information retrieval tool for the lens ranking reinforcement learning model using Kubernetes and Java.

Skills: Statistical Programming, GCS, Docker, Kubernetes, SQL, Java, python, TensorFlow, A/B test, Data analysis, Airflow, Data processing, Machine Learning

Undergraduate Research Assistant- Deep Learning and Security

Boston University, Boston, MA

Jul 2021–May 2022

- Performed an ablation study on [MISA](#), a CNN-based online defense detecting Trojan triggers using attribution features and one-class SVM outlier detection, developed by a PhD researcher in the lab.
- Built modified attack pipelines, such as using [blended triggers](#) and tiny corner-dot patterns, to test whether [MISA](#)'s misattribution detector could be evaded.
- Conducted controlled adversarial experiments on the YouTube Faces dataset to assess detector resilience.

Skills: Explainable ML (Captum library), CNN model (PyTorch), one-class SVM for classification (SciKit-Learn) ([GitHub](#))

Software Engineer Intern- Data Engineer Tools

BitSight, Boston, MA

Jun 2020–Aug 2020

- Designed and implemented a real-time data pipeline to process semi-structured data by integrating multibillions of raw records from third-party sources (ETL process)

Skills: Extracted data from third-party sources (Spark, Hadoop MapReduce, Python, Java), Modeled data by treating infrastructure as code (PySpark, AWS EMR), Loaded data into database for ease of accessibility (Jenkins, Amazon Redshift, SQL)

Projects

ALS Resource App- Web Development, Healthcare

June 2023

- A guided system where an ALS patient will answer a series of questions regarding their symptoms and receive solutions/recommendations at the end. Our client was an ALS expert from the Boston's Children Hospital
- The app content can be dynamically updated by ALS experts with the latest information and resources. (Reactjs, CSS, HTML, MongoDB, Nextjs, NodeJS typescript) ([GitHub](#)) ([Web App Link](#)/)

Recipe Recommender- Web Development, Sustainability

June 2022

- The purpose is to reduce costs and food waste by allowing users to create delicious meals using leftover ingredients.
- Build a recipe search app, in which user can input ingredients and the app will recommend recipes that are closest to their search input. Created REST API to fetch recipes. (Flask, ReactJS, MongoDB, APIs, Python, CSS, HTML)

Weatherway- Web Development

April 2022

- Collaborated with team to build a flight recommender website. It recommends flights based on your weather and flight detail preferences. (Flask, ReactJS, CSS, HTML MongoDB, APIs, Python) ([GitHub](#))

Image Classification of Covid X-Ray- Neural Network

April 2022

- Performed binary classification task that trained a deep learning model to identify X-ray images of patients diagnosed with COVID-19 and healthy patients. Performed multi-class classification that trained a deep learning model to identify the previous two classes.
- Followed transfer learning protocol for model training and used ResNets for base model with fine-tuning

Wildfire Detection System- Machine Learning Tools

Feb 2022

- Building a model to predict forest fire occurrences by analyzing major hotspots and their severity, using meteorological data. (70% accuracy) (Python, Statistical Programming)

Predict Star Rating from Movie Review- Natural Language Processing

Dec 2021

- Performed preliminary analysis on 1,700,000 reviews. Applied text processing, feature extraction and sentiment analysis (NLTK, textblob). Received the 32th position out of 150 in a Kaggle competition.
- Experimented with different models such as Random Forrest, Decision Tree and KNN for model testing and achieved RMSE of 0.8 Used K-fold cross validation and confusion matrix to validate model accuracy.

Covid-Era House Eviction Analysis- Data Analysis, Data Visualization

Dec 2021

- Collaborated with team to analyze Massachusetts eviction patterns during covid-era, using court data and US census tract data. The purpose is to inform the client of who needs more help in terms of the housing experience. (Python, Tableau, Statistical Programming, Time-series analysis, Logistic Regression) ([GitHub](#))