ASAD MAHMOOD

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EDUCATION

University of Iowa (UIowa) **Aug 2018 - Expected: May 2021**
Master of Science (MS) in Computer Science
Relevant Courses: Formal Methods in Software Engineering, Design and Analysis of Algorithms, Data Science, Deep Learning, Statistical Learning, Health Data Analytics

National University of Computer and Emerging Sciences (NUCES-FAST) **Aug 2014 - May 2018**
BS Computer Science
Relevant Courses: Object Oriented Programming, Algorithms, Data Structures, Software Engineering, Database Systems, Artificial Intelligence, Natural Language Processing, Operating Systems, Computer Networks

TECHNICAL STRENGTHS

Languages: Python, C++, NodeJS/JavaScript, Java, Bash, PHP, Dart, Ruby, R (ordered by familiarity)
Web Development: MERN Stack, Flask/Django, Laravel, ROR
Machine Learning: PyTorch, Scikit-Learn, Keras
Mobile Development: Android, Unity3D, Flutter
Frameworks: Git, SQL, Agile, Test Driven Development (TDD), Docker, AWS

WORK EXPERIENCE

Graduate Assistant **Aug 2018 - Present**
Research Assistant: Worked on privancy enhancing techniques using Natural Language Processing (NLP) and Machine/Deep Learning (ML)
Teaching Assistant: Duties include leading discussion sessions and final projects along with checking assignments. Courses: Object Oriented Software Development, Informatics Project and Computer Science Fundamentals

AI/ML Engineer Intern - GSK **May 2020 - Aug 2020**
AI/ML Information Extraction Team
Designed and implemented a pipeline for fine-tuning BioBERT on Named Entity Recognition (NER) task using agile framework . Trained and added BioBERT models in the existing information extraction pipeline which gives 39% relative F1 improvement over older models. Added MetaMap Entity Linking (EL) to existing API . Used pytest for adding unit and integration tests in information extraction API, following Test-driven Development (TDD).

Research Associate - LUMS **Aug 2017 - Mar 2018**
Security and Privacy Group, TPI Lab
Worked in the Data and Privacy team, involved in creating innovative technological solutions for solving everyday problems. Completed projects belong to the domains of Machine/Deep Learning and Data Science (Key Projects detailed below).

Web Developer Intern - LUMS **June 2017 - Jul 2017**
Security and Privacy Group, TPI Lab
Worked as a backend Web Developer on migration of ROR based dataset visualization tool called Statistan from SQL to NoSQL (MongoDB).

RESEARCH PUBLICATIONS

- ***A Girl Has A Name: Detecting Authorship Obfuscation (link) (code)***
  Association for Computational Linguistics, ACL 2020
  Created a tool targeting novel problem of Automated Obfuscation Detection, using the power of pre-trained language models like BERT and GPT-2 for feature extraction, in combination with standard machine learning models like SVM, RFC, GNB and ANNs, for prediction.
- ***A Girl Has No Name: Automated Authorship Obfuscation using Mutant-X (link) (code)***
  Proceedings on Privacy Enhancing Technologies, PoPETs 2019
  Created an automated Authorship Obfuscation tool called Mutant-X, using sentiment preserving word embeddings (Word2Vec) and Genetic Algorithm (GA) to enhance user privacy. Experiments show that Mutant-X can decrease the accuracy of state-of-the-art authorship attribution methods by as much as 64% while preserving the semantics much better than existing automated authorship obfuscation approaches.
- ***Twitter Bots and Gender Detection using Tf-idf (link)***
  PAN-CLEF Shared Tasks, PAN 2019
  Created a SVM based predictive model using Tf-idf features which, given a tweet, can classify it as written by human or bot, to combat fake tweets.

ADDITIONAL DETAILS: KEY PROJECTS

- Reverse Image Search
Created a flask based web application to find images similar to query image, using deep convolutional neural network i.e VGG-19 for image's feature extraction in combination with im2txt model for image's text description.

- Soccer Games Analysis
Worked on in-game analysis of soccer matches through a proprietary dataset of events and tracking data of 6000 soccer matches across four different leagues. Derived several spatiotemporal features from the dataset and developed an adversarial model to provide teams with valuable insights about team's performance while taking the opposition team's strategy and style of play into account.

- Enhancing OLX Ad-verification System
Used affinity clustering with tf-idf features to identify ads with redundant descriptions (Same ad descriptions with some mispellings). Also built a ML pipeline to detect watermarks using YOLO for watermark localization and ANNs for detection.

- Script Tracker (code)
Created an android and Ios mobile application using cross-platform framework i.e., Flutter with Firebase based backend, for tracking the status of python scripts.

- Hotel Management System (HMS) (code)
Created a PHP Laravel based web application for hotel room booking, with database created in MySQL. Implemented interface for customers, managers and administrators with corresponding constraints and permissions.

- Android Custom Keyboard (code)
Java based android application for custom keyboard which extends from official InputMethodService and KeyboardView. Can be changed to create keyboard for any language.

- Predictive Modelling on Stocks Data (code)
Created a flask based tool comparing the predictive modeling power of different Machine/Deep Learning models. For the dataset, I used opening, high, low, and closing values for different stocks like AAL, AAP, AAPL. Models are implemented using scikit-learn and Keras. The performance of each model is shown on plots using Chart.js library.

- Quotastic (code)
Java based android application for showing quotations shuffled randomly. Quotes are saved in and read from SQLite database.

- Kids learning Application (code)
Java based android application for teaching Kids of age 4-7, following HCI principles. Application performs three different tasks. First, provides learning content, second, takes quiz related to that content and third, shows a report card.

- Portfolio Website (code)
Flask based web portfolio containing sections like about, projects, experience, skills etc. Each section has its own json file, which means anyone can change these files to make it their own

- Developers Social Media (code)
Web based social media application for developers where users can login/register, create posts and comment/like on posts. Users can also create profile showing their education, experience and 5 recent most github repos. Application is created using MERN stack.

ADDITIONAL DETAILS: EXTRA-CURRICULAR

- Participated in **Softec Web development** and Graphic Designing competition
- Participated in **UIUC hackathon**
- Served as external reviewer for PoPETs conference
- Lead graphic designing team of Fast Care society
- Served as a graphic designer in ACM-FAST
- Member of Soccer team in High School
- Member of Cricket team in Cricket tournament at FAST