Quazi Irfan

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Summary: Recent grad in Statistics and Computer Science bringing in uncommon combination of competitive programming skill, theoretical understanding of fundamental data analysis algorithms, and research experience with desire to join high performing team and take on ownership of complex business problems with minimal supervision.

Work Experiences

- **Software Engineer** at Query.AI, Brookings, SD 09/2021 - 07/2022
  - Implemented Python modules to **extract, validate and transform data** from REST endpoints
  - Improved Celery task queue performance by **80%** using Python green threads of web app running on Docker(AWS)
  - Improved internal documentation and helped onboard new employee
- **Researcher & Teaching Assistant** at South Dakota State University, Brookings, SD 09/2018 - 12/2021
  - Researched drift compensation using **linear regression** to estimate displacement by double integrating acceleration signal obtained from inertial measurement sensor
  - Researched **signal processing algorithm**(FIR and IIR) to smooth acceleration signal and different **numerical integration** techniques to integrate discrete time signal
  - Built Java Swing application to draw obstacle map and visualized breadth-first search pathfinding algorithm
  - Co-developed **R and SAS programming course** and contributed to textbook 'Learn R through examples'
  - **Fixed logical and library dependency bugs** by decompiling **Java** binary used for data analysis
  - Decreased grading time by **90%** by developing automation scripts to grade x86 assembly programs
  - Implemented **string matching** algorithm(Jaro–Winkler) algorithm to detect similar assignment submissions

Data Analysis & Programming Projects

- Applied **Multiple Linear regression** and **feature selection** methods to correctly identify useful predictors
- Improved **model prediction** accuracy and interpretability by addressing **multicollinearity** problem using Variation Inflation Factor, Ridge and LASSO
- Built classifier for **high dimensional fingerprint dataset** using dimension reduction technique (principal component analysis) and linear discriminate analysis
- Analyzed datasets using **SQL** and developed JavaFX app that dynamically generates UI from DB metadata
- Developed **data visualization dashboard**(web application) using Flask, Pandas and Plotly and deployed on Linux VM running on Google Compute Engine behind Nginx reverse proxy
- Researched 25 years of **Particle Swarm Optimization** and implemented vanilla PSO in Julia and Python
- Implemented **backtracking algorithm** to calculate Schur's number
- Implemented **Markov chain Monte Carlo** sampler in R and C++ to compute posterior distribution
- Developed **assembler for SIC-XE instruction set** in Java
- Developed Ada to 16bit Intel 8086 **compiler** using recursive descent parser generating three address code
- Built 2d side-scrolling game using Java 2d featuring axis-aligned-bounding-box collision detection
- Organized multiple ACM seminars on **Git** and **Vim**; Reported bugs on Unity3d and IntellijIDEA

Education & Skills

- MS **Statistics** (Fall '21) and BS **Computer Science**(Summer '18) from South Dakota State University
- **Skills**: Python(Numpy, Flask, Matplotlib, sklearn, statsmodels, Plotly, Pytest), R, Java, SQL(PostgreSQL), Redis, Bash, Linux, HTML/CSS, Javascript, REST, Git, Github, Vim, Docker, Algorithm analysis, Relational database, Linear Algebra, Statistical Inference and Modeling(Regression and Multivariate Analysis), Bayesian Statistics

Publications & Awards

- Building exoskeleton glove on virtual reality platform - **Irfan, Q.**, Jensen, C., Ni, Z. & Hietpas, S., 2018 IEEE EIT
  - Bennett Fellowship recipient(**$5,000**) to build game and **motor-driven VR gloves** to track finger movement and send haptic feedback when the real finger interacts with a virtual object(**Research Blog** on Medium)
- Inertia Measurement Unit-Based Displacement Estimation via Velocity Drift Compensation Using Ordinary Least Squares Method - **Irfan, Q.**, Ciarcia, M. and Hatfield, G., 2022 IEEE EIT