Quazi Irfan

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Summery: Recent grad in Statistics(Fall '21) and Computer science(Summer '18) seeking full-time position to take on complex programming and data analysis problems. Experienced in research with strong theoretical understanding of fundamental data modeling algorithms and trained in relational database systems.

Experiences & Projects

- **Software Engineer** at Query.AI, Brookings, SD 09/2021 - 07/2021
  - Implemented and fixed bugs of Python modules to **extract, validate and transform data** from **REST** endpoints
  - Improved task queue(Celery, Redis) performance by **80%** using Python green threads of web app running on Docker(AWS)
- **Graduate Researcher** at South Dakota State University, Brookings, SD 09/2020 - 12/2021
  - Researched robot localization using inertial measurement sensor by building hardware platform and researched **signal processing algorithms** to calculate displacement from acceleration signal
  - Researched **FIR** and **IIR** filtering algorithms and different **numerical integration** methods to smooth and integrate sensor signal using Python(Numpy, Matplotlib)
  - Implemented **breadth first search** pathfinding algorithm
- **Graduate Teaching assistant** at South Dakota State University, Brookings, SD 09/2018 - 05/2020
  - Co-developed **R and SAS programming course** and contributed contents to textbook 'Learn R through examples'
  - **Fixed logical, library dependency bug** by decompiling **Java** binary used for finger print data analysis
  - Decreased grading time by **90%** by developing automation scripts to grade (x86 assembly) programming assignments
  - Implemented **Jaro–Winkler string distance algorithm** to detect similar assignment submissions
- **Data Analysis Projects** at South Dakota State University, Brookings, SD 08/2018 - 12/2021
  - Analyzed data sets using **Multiple Linear Regression** using **R** and **statsmodels** Python library
  - Researched about **Feature selection, Model selection and Model validation** using different techniques
  - Addressed **multicollinearity** problem using Variation Inflation Factor, Ridge and LASSO
  - Built classifier for **high dimensional dataset** using dimension reduction technique (principal component analysis) and linear discriminate analysis
  - Analyzed datasets using **SQL**(PostgreSQL) and developed JavaFX app that dynamically generates UI from DB metadata
  - Built multiple classifiers using **scikit-learn machine learning** library
  - Built **data visualization** web application using Flask, Pandas and Plotly(Javascript) and deployed it on **Google Cloud Linux VM** behind Nginx reverse proxy.
- **Programming Projects** at South Dakota State University, Brookings, SD 08/2015 - 08/2018
  - Researched **Particle Swarm Optimization** algorithm and implemented vanilla PSO in Julia and Python
  - Implemented **backtracking algorithm** to calculate Schur's number
  - Implemented and benchmarked **Markov chain Monte Carlo** sampler in R and C++ to compute posterior distribution
  - Implemented **assembler for SIC-XE instruction set** in Java
  - Implemented **Ada to 16bit Intel 8086 compiler** using recursive descent parser generating Three address code
  - Developed 2d Asteroid like game using Java 2d that features **AABB collision** detection
  - Organized multiple ACM seminars on **Git** and **Vim**; Reported bugs on Unity3d and IntellijIDEA
- **Undergraduate researcher** at South Dakota State University, Brookings, SD 09/2017 - 07/2018
  - Received **$5,000** funding for research proposal to build gloves for Virtual Reality
  - Built 3d game and motor driven gloves connected to the game via socket to track single finger movement and send haptic feedback when collision detected with virtual object; **Blog**

Education & Skills

- M.S. in **Statistics (Fall '21)** and B.S. in **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, Regression Analysis, Multivariate Analysis, Bayesian Statistics

Publications

- Building an exoskeleton glove on virtual reality platform - **Irfan, Q.**, Jensen, C., Ni, Z., & Hietpas, S. (2018, May)
- Inertia Measurement Unit-Based Displacement Estimation via Velocity Drift Compensation Using Ordinary Least Squares Method - **Irfan, Q.**, Ciarcia M., & Hatfield G. (2022, May)