Quazi Irfan

Software Engineer | Data Engineer
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Summary: Software and Data Engineer with prior experience in building and maintaining large data pipelines for complex data set for animal biotech and cyber security. Currently looking for opportunities where I can apply both programming and data science skills. At work, I am consistently trying to maximize my impact by paying attention to the smallest of details and actively learning to find simpler way to solve problems.

Education & Work Experiences

- MS **Statistics** (Fall '21) and BS **Computer Science**(Summer '18) from South Dakota State University
- **Data Engineer** at Genus(ABS Global), Madison, WI 11/2022 - Current
  - Developed, tested, and maintained data pipeline using Python, DBT, and SQL(Trino) to capture and transform **billions of records** and produced data products for researchers
  - Collaborated with multidisciplinary teams to improve existing data pipelines and **identify sources of bad data and apply fixes** to the pipeline
  - Developed and maintained multiple **dashboards**(Metabase) to monitor ongoing data issues and KPI metrics to aid decision-making
  - Improved data pipeline run time by **90%** by replacing Python script with optimized SQL query
  - Provided **support for researchers** in writing SQL queries and addressed new data requirements by converting business requirements into data questions
  - Continuously learning **database technologies**, such as B-Tree, Column storage and presenting it to team
- **Software Engineer** at Query.AI, Brookings, SD 01/2022 - 07/2022
  - Built ELT pipeline in Python to extract data from REST endpoints and validated data using PyTest unit test
  - Improved server response time by **80%** by switching to Python green thread in task queue(Celery)
- **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'
  - 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 discriminant analysis
- 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

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

References

- **Dr. George Hamer, Ph.D.**
  Assistant Department Head
  Associate Professor
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  (Instructor in CSC-314 Assembly Language, CSC-354 Systems Programming and CSC-446 Compiler Construction)
- **Dr. Gary Hatfield, Ph.D.**
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  (Graduate research advisor and instructor in Stochastic process and Probabilistic robotics course)
- **Dr. Marco Ciarcia, Ph.D.**
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