Quazi Irfan

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Obj: Interested in working on problems that require fusing Computer Science and Statistics skills

Education & Skills

- M.S. in **Statistics** from South Dakota State University - Graduated on **Fall '21**
  B.Sc. in **Computer Science** from South Dakota State University - Graduated on **Summer '18**
- **Areas of Expertise**: Algorithm analysis, Database, Linear Algebra, Statistical Programming, Multiple Linear Regression, Logistic Regression, Statistical Inference, Cluster Analysis, Multivariate Analysis, Bayesian Statistics

Experiences

- **Software Engineer** — Query.AI Sept 2021 - Current
  - Implemented Python modules to interface and normalize data from **REST** endpoints
  - Optimized task queue(Celery) performance using Python multiprocessing and green threads
- **Graduate Research** — Robot Localization using inertial measurement sensors Sept 2020 - Dec 2021
  - Developed hardware platform with multiple inertial sensors and signal processing algorithms to estimate displacement from acceleration
  - Researched **FIR** & **IIR** based signal processing algorithms to smooth out sensor data and **numerical integration** methods to integrate signal
  - Implemented **breadth first search** path finding algorithm
- **Graduate Teaching assistant** Sept 2018 - May 2020
  - Developed **R and SAS programming courses** and contributed contents to book **Learn R through examples** by Dr. Xijin Ge
  - **Fixed logical, library dependency bug** in a legacy Java code base used for data analysis and setup a Gradle build system to simplify development
  - Developed **automation script** to grade x86 Assembly programs and implemented **Jaro–Winkler string distance algorithm** to successfully detect similar assignment submissions
- **Undergraduate Research** — Building wearable exoskeleton for Virtual Reality Sept 2017 - May 2018
  - Built a 3d game in Java to test out the VR hardware; Blogged on Medium
  - Built JavaFX utility tool to send commands to motor hardware over serial port

Projects

- **Data Analysis**
  - Analyzed data sets using **Multiple Linear Regression**
  - Researched about Feature selection, Model selection and Model validation using different techniques
  - Addressed multicollinearity problem using Variation Inflation Factor, Ridge and LASSO
  - Analyzed and classified **high dimension data** using dimension reduction technique (principal component analysis) and linear discriminate analysis
  - Trained simple **neural network** for classification
- Researched and Implemented **Particle Swarm Optimization** algorithm and its variants in Julia and Python
- Implemented **back-propagation algorithm** to calculate Schur's number
- Implemented **Markov chain Monte Carlo** in R and C++ to calculate posterior probability distribution
- Implemented an **assembler for SIC-XE instruction set** in Java
- Implemented **Ada to 16-bit Intel 8086 compiler** in Java
  - Implemented recursive descent parser that generates intermediate Three address code
- Developed 2d Asteroid like game using Java 2d that features **AABB collision** detection
- Developed a Java Swing project that **dynamically generates UI frontend** from MySQL database metadata
- Organized multiple ACM seminar on **Git** & **Github**; Reported bugs on Unity3d, IntellijIDEA and jMonkeyEngine

Publications & Awards

- **$5,000** Bennett Undergraduate Electrical Engineering Summer 2017 Research Fellowship
- 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)

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References

- **Dr. George Hamer, Ph.D.**
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  George.Hamer@sdstate.edu
  (Instructor in CSC-314 Assembly Language, CSC-354 Systems Programming and CSC-446 Compiler Construction)

- **Dr. Gary Hatfield, Ph.D.**
  Associate Professor
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  605-688-5846
  gary.hatfield@sdstate.edu
  (Graduate research advisor and instructor in Stochastic process and Probabilistic robotics course)

- **Dr. Marco Ciarcia, Ph.D.**
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