Quazi Irfan

New York City · quazirfan@gmail.com
github.com/quazi-irfan
linkedin.com/in/quazi-irfan
medium.com/@quazirfan
StackOverflow/quazi-irfan

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

Education

- 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

Skills

- **Areas of Expertise**: Algorithm analysis, Database, Linear Algebra, Statistical Programming, Multiple Linear Regression, Logistic Regression, Statistical Inference, Cluster Analysis, Multivariate Analysis, Bayesian Statistics
- **Tools**: Java, Python, R, Git & GitHub, Gradle/Maven, GNU/Linux, Base, Vim, C, C++, SQL

Experiences

- **Software Engineer** — Internship at **Query.AI** Sept 2021 - Current
  - Implemented Python modules to interface with for multiple **REST** API endpoints
  - Optimized task queue(Celery) performance using Python multiprocessing and green threads
  - Contributed to internal documentation and helped on-boarding new contributors
- **Graduate research** — Robot Localization using inertial measurement sensors Sept 2020 - Dec 2021
  - Developed signal processing algorithm to remove drift when estimating displacement from acceleration
  - Developed hardware platform to acquire data from multiple inertial measurement sensors
  - Researched **FIR** & **IIR** based signal processing algorithms to smooth out sensor data
  - Researched different **numerical integration** methods to integrate accelerometer data
  - Implemented **BFS** path finding algorithm
- **Graduate Teaching assistant** Sept 2018 - May 2020
  - Developed undergraduate and graduate level **R and SAS programming courses** at SDSU
  - Contributed contents and fixes to book 'Learn R through examples - Dr. Xijin Ge'
  - Fixed bugs in **large legacy Java code base** used for data analysis
  - Setup a build system and fixed dependency bugs by **reverse engineering** compiled Java program
  - Wrote **automation script** for grading x86 Assembly homework programs
  - Implemented **Jaro–Winkler distance algorithm** to detect similar homework submissions
- **Undergraduate Research** — Building wearable exoskeleton for Virtual Reality Sept 2017 - May 2018
  - Worked with a large Java code base and built a 3d GUI for a VR game; Blogged on Medium
  - Built JavaFX utility tool to send commands to motor hardware over serial port

Projects

- Analyzed different 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 method
- Analyzed and classified **high dimension data** using dimension reduction technique (principal component analysis) and linear discriminate analysis
- Trained **neural network** for classification
- Implemented **Assembler for SIC-XE instruction set**
- Implemented **Ada to 16-bit Intel 8086 compiler**
  - Implemented recursive descent parser that generates intermediate Three address code
- Developed **UI front-end for MySQL database in Java using JDBC and Swing**
- Researched **Particle Swarm Optimization** algorithm and its variants; Implement vanilla PSO in Julia
- Implemented back-propagation algorithm to calculate **Schur's number**
- Implemented **Markov chain Monte Carlo algorithm** to calculate posterior probability distribution
- Wrote a thin game engine like wrapper around Java2d that features AABB collision detection
- Lead Robotics Club software team; Held multiple ACM seminar on **Git** & **Github**; Reported bugs in Unity3d, IntellijIDEA and jMonkeyEngine; Participated in multiple competitive programming contest(**ICPC**) and Hackathons

Publications & Awards

- **$5,000** Bennett Undergraduate Electrical Engineering Summer 2017 Research Fellowship
- Irfan, Q., Jensen, C., Ni, Z., & Hietpas, S. (2018, May). Building an exoskeleton glove on virtual reality platform
- Irfan, Q., Ciarcia M., & Hatfield G. (2022, May). Inertia Measurement Unit-Based Displacement Estimation via Velocity Drift Compensation Using Ordinary Least Squares Method

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References

- **Dr. George Hamer, Ph.D.**
  Assistant Department Head
  Associate Professor
  Electrical Engineering and Computer Science Department
  South Dakota State University
  SECS 121
  Brookings, S.D. 57007
  605-688-5721
  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
  Mathematics & Statistics Department
  South Dakota State University
  Architecture, Math & Engineering Building 256
  Math & Statistics-Box 2225
  University Station
  Brookings, SD 57007
  605-688-5846
  gary.hatfield@sdstate.edu
  (Graduate research advisor and instructor in Stochastic process and Probabilistic robotics course)

- **Dr. Marco Ciarcia, Ph.D.**
  Assistant Professor
  Department of Mechanical Engineering
  South Dakota State University
  Crothers Engineering Hall - Office 210
  Mechanical Engineering-Box 2219
  University Station
  Brookings, SD 57007
  605-688-5908
  Marco.Ciarcia@sdstate.edu
  (Graduate research advisor)