Sowndarya Krishnan Navaneetha Kannan

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Highlands Ranch, CO, USA

Research Interests

Hybrid Quantum–Classical Machine Learning (QX-ML); Quantum Computing for Scientific Simulations; Quantum Algorithms for PDE-based Models; Integration of Quantum Methods with Multiscale and Multiphysics Modeling; Applications to Porous Media and Complex Physical Systems.

Education

- **Colorado School of Mines** *Aug 2025 – Present*
  PhD in Computer Science Golden, CO, USA
  - Advisor: Prof. Pejman Tahmasebi | Lab: G4 Lab
- **Colorado School of Mines** *Aug 2023 – May 2025*
  MS in Computer Science Golden, CO, USA
  - Advisor: Prof. Gabe Fierro | Lab: Data-Driven CPS Lab
  - GPA: 3.6 / 4.0
- **Anna University** *Aug 2018 – Aug 2022*
  B.E. in Electronics & Communication Engineering Chennai, India
  - GPA: 8.56 / 10 | Graduated: First Class with Distinction

Experience

- **G4 Lab [🌐]** *Fall 2025*
  Research Assistant Golden, CO, USA
  - Conducting research at the intersection of **quantum computing and AI**, designing hybrid quantum–AI algorithms for scientific computing.
  - Reformulating PDE-based models for quantum hardware to simulate multiscale, multiphysics processes in science and engineering.
- **Colorado School of Mines [🌐]** *Fall 2025*
  Teaching Assistant — CSCI 575: Advanced Machine Learning Golden, CO, USA
  - Supported students through office hours and discussions, clarifying advanced concepts and coursework in machine learning.
  - Assisted with student projects, assignments, and practical problem-solving.
- **Data-Driven CPS Lab [🌐]** *Aug 2023 – Summer 2025*
  Research Assistant Golden, CO, USA
  - Conducted research on **SHACL validation and inference**, focusing on RDF graph acceleration and semantic interoperability.
  - Developed scalable **data validation pipelines** for real-time IoT and Smart City applications.
  - Contributed to the **BrickSchema Ontology** project, implementing enhanced search functionality now adopted globally.
  - **Technologies:** RDF, SHACL, SHACL-AF, Python, JavaScript, Git, Linux, Bash
- **Sloan Foundation Interdisciplinary Project [🌐]** *Jan 2023 – Present*
  Frontend Developer & Backend Engineer Leadville, CO, USA
  - Designed and implemented **backend solutions** for large-scale time-series data on community energy consumption.
  - Built a **real-time community dashboard** with accessible, inclusive UI/UX for diverse stakeholders.
  - Developed scalable pipelines and optimized retrieval for energy time-series datasets.
  - **Technologies:** React, PostgreSQL, Firebase, Docker, Grafana, AWS SNS, VPN
- **NCompass Tech Studio Pvt. Ltd [🌐]** *May 2021 – May 2022*
  Mobile Engineer, Frontend Engineer & Cloud Engineer Chennai, India
  - Developed mobile applications and cloud solutions using Kotlin, Flutter, and Android.
  - Led a major UI redesign, resulting in **1,000+ additional downloads** on the Play Store.
  - Built reusable components, increasing integration efficiency by **25%** across teams.
  - Ensured high-quality releases with TDD and CI/CD, achieving a **98% bug-free rate**.
  - **Technologies:** Android, Kotlin, Flutter, Node.js, React, AWS, GCP, Terraform, Docker, Grafana, SQL, Firebase, Git, DevOps

PROJECTS

- **LLM-Prompt-Recovery: Fine-Tuning GPT-2 for Prompt Generation** *Dec 2024*
  Tools: Python, PyTorch, Hugging Face [🌐]
  ◦ Developed a GPT-2-based model for generating rewrite prompts, exploring generalization improvements.
- **Echoes of Equality: Hackathon-Winning Social Platform** *Feb 2022*
  Tools: React, Node.js, Firebase, Google Cloud [🌐]
  ◦ Won **1st Place** in Beginner Category & LGBTQIA+ Category at BlasterHacks Hackathon.
  ◦ Designed a social platform for LGBTQIA+ mentorship, fostering inclusivity and support.
- **EMI Calculator: Multi-Platform Loan EMI Tool** *May 2023*
  Tools: Flutter, Dart, PDF Generation [GitHub]
  ◦ Built a cross-platform EMI calculator with a user-friendly UI and PDF report generation support.
- **Auto File Organizer: Automated File Management Script** *Jan 2022*
  Tools: Python, OS, File I/O [GitHub]
  ◦ Created a Python script to automatically categorize and organize downloaded files.

PUBLICATIONS

C=CONFERENCE, J=JOURNAL, P=POSTER, S=IN SUBMISSION, T=THESIS

[P.1] A. Anwar, U. M. Saka, **S. Krishnan Navaneetha Kannan**, D. Safronov, P. Salter, K. Munz, G. Fierro, P. C. Tabares Velasco, and Q. Huang. *"Poster Abstract: Economic Feasibility of IoT-Based Controls in Low-Income Residential Buildings."* Accepted for presentation at the **12th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys'25 Posters and Demos)**, 2025.

[S.1] A. Anwar, U. M. Saka, **S. Krishnan Navaneetha Kannan**, *et al. "Economic Feasibility of IoT-Based Controls in Low-Income Residential Buildings."* Manuscript under review (in submission), 2025.

SKILLS

- **Programming Languages:** Python, Java, C, Kotlin, Flutter (Dart), JavaScript (Node.js, React, TypeScript), OCaml, LISP
- **Web & App Technologies:** React, Node.js, Angular.js, Nest.js, Android App Development, HTML/CSS
- **Database Systems:** PostgreSQL, SQL, Firebase
- **Data Science & Machine Learning:** Machine Learning, Deep Learning, Data Pipelines, RDF Graphs, SHACL, SHACL-AF, Qiskit, PennyLane
- **Cloud Technologies:** AWS, GCP, Azure, Firebase
- **DevOps & Version Control:** Docker, Terraform, Git, Linux, Grafana
- **Specialized Areas:** Quantum Computing, PDE-based Simulations, Hybrid QX-ML, Multiscale Modeling
- **Mathematical & Statistical Tools:** Numerical Simulation, Algorithms, Cryptography, Statistics
- **Other Tools & Technologies:** MS Office, Jira, Bash, LaTeX
- **Research Skills:** Quantum Algorithms, RDF/SHACL Validation, Time-Series Data Analysis, Accessible UI/UX Design, Interdisciplinary Collaboration

REFERENCES

1. **Dr. Pejman Tahmasebi**
   Associate Professor, Petroleum Engineering
   Colorado School of Mines
   Email: ptahmase@mines.edu
   Relationship: PhD Advisor (G4 Lab)
2. **Dr. Gabe Fierro**
   Assistant Professor, Computer Science
   Colorado School of Mines
   Email: gtfierro@mines.edu
   Relationship: MS Advisor (Data-Driven CPS Lab)

KEYWORDS

Core Areas: Artificial Intelligence, Machine Learning, Deep Learning, Quantum Computing, Hybrid Quantum–AI, Data-Driven Modeling, Scientific Computing, Internet of Things (IoT), Smart Cities, Cyber-Physical Systems (CPS)
Software Engineering: Full-Stack Development, Mobile App Development, Frontend Engineering, Backend Systems, RESTful APIs, Cloud Architecture, DevOps, Continuous Integration / Continuous Deployment (CI/CD), Microservices, Containerization, Version Control, Agile Development
Technical Skills: Python, JavaScript, TypeScript, Kotlin, Flutter, React, Node.js, Express, Android, SQL, PostgreSQL, Firebase, Docker, AWS, GCP, Terraform, Grafana, Git, Linux, Bash, HTML, CSS
Research & Methods: PDE Modeling, SHACL Validation, RDF Graphs, Semantic Web, Data Validation Pipelines, Graph Neural Networks, Generative Models, Time-Series Analysis, Optimization, Edge Computing, Model Explainability, Cloud-Native Development