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

- **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 development.
  ◦ Led a major UI redesign for the company's Android app, resulting in **1,000+ additional downloads** on the Play Store.
  ◦ Created custom reusable components, driving a **25% increase in integration** across business groups.
  ◦ Ensured high-quality code by applying Git, unit testing, and TDD, achieving a **98% bug-free release rate**.
  ◦ **Technologies:** Android, Kotlin, Flutter, Node.js, React, AWS, GCP, Terraform, Docker, Grafana, SQL, Firebase, Git, DevOps

- **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

- **Data-Driven CPS Lab [ ]** *Aug 2023 – Present*
  Graduate Research Assistant Golden, CO, USA
  ◦ Conducting research on **SHACL validation and inference** under Prof. Gabe Fierro, with a focus on RDF graph acceleration.
  ◦ Improving scalable **data validation pipelines** for real-time applications in IoT and Smart Cities.
  ◦ **Technologies:** RDF, SHACL, SHACL-AF, Python, Git, Linux, Bash

- **BrickSchema Ontology [ ]** *June 2024*
  Contributor Remote
  ◦ Implemented a new search functionality (using Fuse.js), resolving a long-standing issue now widely used worldwide.
  ◦ **Technologies:** JavaScript, Git

PROJECTS

- **Echoes of Equality: Social Platform for LGBTQIA+ Support** *Feb 2022*
Tools: React, Node.js, Firebase, Google Cloud [○]
  - Won **1st Place in Beginner Category & LGBTQIA+ Category** at BlasterHacks Hackathon.
  - Built a platform to foster inclusivity and social support through interactive community features.
  - Designed impactful UI/UX, receiving special recognition from judges for innovation and social impact.

- **Community Energy Dashboard: Real-Time Visualization Platform** *May 2024 – Present*
Tools: React, Firebase, AWS SNS (in progress) [⊕]
  - Collaborated with interdisciplinary teams to design a **real-time dashboard** for community energy consumption.
  - Ensured accessibility and usability for diverse users by following **inclusive UI/UX design guidelines**.
  - Built dynamic visualizations to support informed decision-making for local stakeholders.

- **BrickSchema Ontology Contribution: Global Ontology Enhancement** *June 2024*
Tools: JavaScript (Fuse.js), Git [⊕]
  - Contributed a new **search functionality**, solving a long-standing issue and enabling faster global adoption.
  - Integrated Fuse.js for efficient client-side search, now used by developers worldwide.

PATENTS AND PUBLICATIONS C=Conference, J=Journal, P=Patent, S=In Submission, T=Thesis

[S.1] In Progress

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

Quantum Computing, Quantum Algorithms, Qiskit, PennyLane, Scientific Simulations, Partial Differential Equations (PDEs), Hybrid Quantum–Classical Machine Learning (QX-ML), Multiscale Modeling, Multiphysics Systems, Fluid Flow in Porous Media, Artificial Intelligence (AI), Machine Learning (ML), Deep Learning, Neural Networks, Natural Language Processing (NLP), Computer Vision, Data Validation, SHACL, RDF, Algorithms, Data Structures, Software Engineering, Object-Oriented Programming (OOP), Agile Development, Cloud Computing (AWS, GCP, Azure), DevOps, CI/CD, Docker, Terraform, Git, SQL, PostgreSQL, NoSQL, React, Node.js, JavaScript (TypeScript, Angular, Nest.js), Python, Java, C, Kotlin, Flutter, Android Development