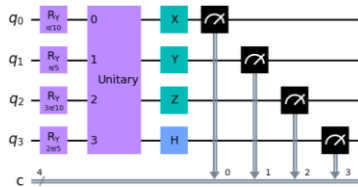# Current Quantum Research Includes:

Quantum Image Fusion for Radar Applications

This research uses Qiskit to perform quantum-based fusion, designed specifically for processing SAR and optical images.

Quantum Linear Prediction and Quantum Fourier Transforms

This research focuses on the design and implementation of quantum algorithms and circuits for linear prediction.
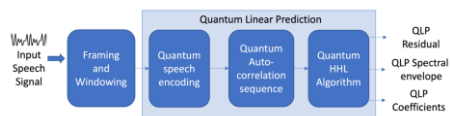

Fig : Quantum linear prediction block diagram.

Quantum Filtering

This research is focused on exploring the use of quantum filtering to create a new quantum enhanced spectrogram.

Benefits of Joining the Consortium

Cost effective and reduced overhead research

Projects co-advised by industry and faculty

Privileged access to student portfolios

Access to algorithms/tools/documents

Industry-friendly IP arrangement

Contact Us

Phone: 480-965-5311
Email: sensip@asu.edu
Web: https://sensip.engineering.asu.edu/

ARIZONA STATE UNIVERSITY
650 E. Tyler Mall
Tempe, AZ, 85281

Research Areas:

Quantum Systems

Machine Learning

Signal Processing

ARIZONA STATE UNIVERSITY

SenSIP Industry Consortium

Industry Consortium

The mission of the SenSIP Industry Consortium is to perform use-inspired research and train students in sensor and information systems, digital signal and image processing, wireless communications, machine learning, and quantum AI.

Applications addressed include integrated sensing, defense and homeland security, sustainability and environmental technologies, speech/audio processing, 6G+ telephony, imaging and video systems, low power realizations, real-time implementations, AI monitored solar energy, smart cameras, radar, and vehicular sensing.

We have 9 current members of the SenSIP center sponsoring research in sensors and machine learning. Recent quantum sponsorship includes: The National Science Foundation (NSF), the Quantum Collaborative, General Dynamics, and ASU Knowledge Enterprise.
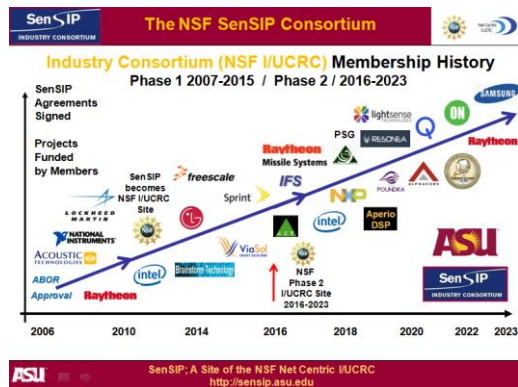
Workforce Programs

NSF REU Program – This program provides students with integrative research experiences at the intersection of sensor device and quantum algorithm development.

NSF IRES Program – Each summer, we train and bring a student cohort to participate in international ML and QML research programs at DCU and UCy.

NSF RET Program – Enables local STEM-focused K-12 teachers and community faculty to partake in leading-edge sensor and machine learning research and involves curriculum development.

Meet the Team

The quantum research group is comprised of student research associates pursing degrees in diverse fields. The team includes Glen Uehara (PhD), Tanay Patel (PhD), Leslie Miller (MS), Nandika Goyal (MS), Smylena Dsilva (MS), Movinya Gunatilaka (BS), Salil Naik (BS), Vivek Narayanaswamy (graduated), Aradhita Sharma (graduated), and Maxwell Yarter (graduated).
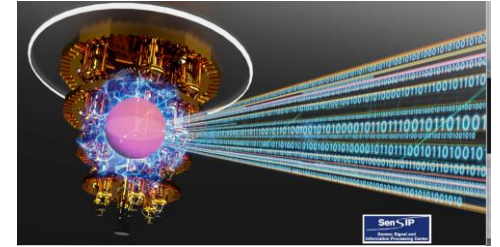
Recent Accomplishments

Papers Titles of Recent Publications

Quantum Linear Prediction for System Identification and Spectral Estimates

Quantum Machine Learning for Optical and SAR Classification

Quantum Image Fusion Methods for Remote Sensing (March 2024)

Quantum Machine Learning for Audio Classification Applications to Healthcare

EDGE Cloud Voice Recognition using Quantum Neural Networks

Quantum Neural Network Parameter Estimation for Photovoltaic Fault Detection

Recent Awards

Work in Quantum Fourier Transforms for Signal Analysis presented at ICASSP 2023 paper rated Top 3%

SPIE 2023 Best Paper Award, Kristen Jaskie (Post-Doc)

Ira A. Fulton Schools of Engineering Impact Award Recipient, Leslie Miller