

1 RRC Details

Rincon Research Corporation's core business is to design, build, test, and field high-performance digital signal processing (DSP) products and services for the U.S. Defense and Intelligence communities. With over 35 years of expertise, we provide our customers with superior solutions for signal collection, analysis, and processing; GPS application development; DSP system and infrastructure development; and orbit analysis. We have diversified through the expertise of our talented teams of scientists, engineers, programmers, writers, and support staff who focus on rapidly developing technology from concept to operation. Our DSP products and services ensure successful outcomes to meet mission and business objectives.

2 Supervisor

The supervisor for this effort is Mel Rose. Ms. Rose has been an Engineer/Scientist at RRC since 2019. She works on algorithms derived from radio astronomy, signal analysis, and ionospheric physics. Prior to employment at RRC, Ms. Rose performed signal analysis research in various astronomy and physics collaborations, including the Event Horizon Collaboration (EHT), Laser Interferometer Gravitational-Wave Observatory (LIGO), and the Joint Institute for VLBI (JIVE).

3 Job Description

Improving Synthetic Aperture Radar Data Processing Algorithms

This internship focuses on implementing and evaluating astronomy-based interferometric techniques for use in synthetic aperture radar data processing algorithms. The intern will use best practices to implement the algorithms in code and evaluate their effectiveness using synthetic data. The intern is expected to engage with and modify the algorithms as needed to improve results. The intern will provide technical documentation of the results and a company-wide technical talk at the end of the summer. Result of the investigation is an internal Rincon Research Corp report. The ability to publish a paper based on report is currently not expected.

3.1 Student Benefit

The skills the intern is expected to gain include: coding best practices such as continuous integration, testing, and documentation; how to implement computationally efficient algorithms and perform numerical analysis; how to evaluate algorithmic performance; and how to advertise technical results in documentation and talks.

3.2 Candidate Description

The ideal candidate will have the following skills. Independent research and development skills, including literature search and synthesis, writing, and presentation. Basic coding skills such as Python or C++. Strong physics and math skills including linear algebra, electromagnetic theory, Fourier analysis, and statistics. Familiarity with traditional radio astronomy synthetic aperture imaging.

4 US Citizenship

US Citizenship is required.