

Software Developer (Digital Signal Processing)

Position Purpose

At Fourier Space, we engineer high-performance software solutions that power groundbreaking Radio Astronomy systems and advanced Commercial Instrumentation. We seek a skilled Software Developer to join our multidisciplinary team in designing, optimizing, and deploying real-time digital signal processing (DSP) applications. In this role, you will contribute to algorithm optimization, software architecture, and system modeling, bridging cutting-edge scientific research with robust commercial software engineering.

Role Overview

Position Title	Software Developer
Reporting To	Software Engineering Lead
Employment Type	Full-time, In-person
Location	Advanced Manufacturing and Design Centre (AMDC), Swinburne University Hawthorn Campus, VIC (Occasional travel required for customer site commissioning)
Work Rights	Unrestricted Australian working rights preferred
Appointment Level	Junior, Base or Senior Developers
Remuneration	\$95,000 – \$145,000 (commensurate with level and experience) + 17% superannuation

Key Responsibilities

Software Engineering & Optimization

- Develop and maintain software libraries, processing pipelines, and tools for real-time digital signal processing (DSP).
- Profile, benchmark, and optimize software algorithms across multi-core and distributed architectures.

- Build mathematical models and simulation environments for software validation and testing.
- Author technical documentation, architecture specs, and user reference guides.
- Provide operational support and troubleshooting for deployed customer systems.

Teamwork & Stakeholder Engagement

- Work within an Agile/DevOps framework to deliver team milestones efficiently while minimizing downstream waste.
- Communicate complex technical concepts clearly to internal team members, researchers, and external stakeholders.
- Participate in planning processes to prioritize tasks and deliver software outcomes.

Safety & Workplace Culture

- Comply with all Occupational Health and Safety (OHS) instructions, incident reporting protocols, and emergency procedures.
- Uphold workplace standards regarding Anti-Discrimination, Equal Opportunity, and Harassment prevention.

Key Selection Criteria

The position is offered at Junior, Base or Senior levels of software development experience. With the higher levels expected to possess more full-time experience and to satisfy more of the Essential and Desirable criteria.

Qualifications

- Bachelor of Computer Science, Software Engineering, or a related discipline; or
- Masters or PhD in Astrophysics with software development and radio astronomy as key aspects of the degree.

Experience, Knowledge, Attributes

Essential Criteria

- **Experience:** Open to varying levels (Junior: 0–2 years; Base: 3–5 years; Senior: 5+ years) of full-time software engineering experience. Candidates will be assessed against criteria relative to their experience level.
- **Core Languages & Tools:** Strong proficiency in modern C/C++ (C++17/20 preferred), Python, and Git version control.
- **Signal Processing & HPC:** Sound knowledge of DSP concepts or digital systems (essential for Senior/Base; foundational understanding expected for Junior candidates). Particularly relevant are Fourier transforms and convolution methods, and multi-core/distributed data-driven processing.

- **Profiling & Performance:** Demonstrated experience using high-performance profiling tools to optimize execution speed and resource consumption.
- **Agile Engineering:** Proven capability working in Agile and DevOps environments with rapid development cycles.
- **Communication & Collaboration:** Strong "T-shaped" skill set - deep technical depth combined with the ability to collaborate across disciplines. Clear written and verbal communication skills.
- **Compliance Requirement:** A valid Working with Children Check (WWCC) card (or ability to obtain one prior to starting), required due to co-location on Swinburne University campus.

Desirable Criteria

- **Domain Knowledge:** Experience in Radio Astronomy, satellite communications, or commercial instrumentation systems.
- **GPU & Acceleration:** Experience developing CUDA and GPU acceleration algorithms for high-throughput data processing.
- **Containerization & Deployment:** Hands-on experience with containerization and orchestration platforms (e.g., Docker, Kubernetes).
- **Testing & CI/CD Pipelines:** Experience with test automation, test-driven development (TDD), and continuous integration (CI/CD) pipelines.

What We Offer

- **Modern Workspace:** Office located in the AMDC building at Swinburne University (Hawthorn), right next to Hawthorn train station and the Glenferrie Road precinct.
- **Impactful Work:** Work on high-performance software projects pushing the boundaries of space instrumentation and astrophysics research.

Application Instructions

To apply, please submit your resume and a cover letter directly addressing the Key Selection Criteria to jobs@fourierspace.com.au. We recommend including links to contributions to code repositories (GitHub, GitLab, etc) that highlight your skills.