# Position Description

| College/Division: | ANU College of Science |
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| Faculty/School/Centre: | Research School of Astronomy and Astrophysics |
| Department/Unit: | Advanced Instrumentation and Technology Centre |
| Position Title: | Adaptive Optics Real-Time Software Engineer |
| Classification: | ANU Officer Grade 8 (Information Technology) |
| Position No: | TBA |
| Responsible to: | Adaptive Optics Group Lead |
| Number of positions that report to this role: | 0 |
| Delegation(s) Assigned: | NA |

## PURPOSE STATEMENT:

The Advanced Instrumentation and Technology Centre (AITC) at the Research School of Astronomy and Astrophysics (RSAA) has high-level engineering and scientific teams that develop innovative state-of-the-art instrumentation for astronomy, space applications, laser communications and advanced materials. The Adaptive Optics (AO) Real-Time Software Engineer plays a major role in the development of the real-time computing hub at the AITC. Together with the Instrument Scientist and other software engineers, the AO Real-Time Software Engineer will support the production of AO real-time computers (RTC) for major observatories. The position will bring critical knowledge of computer systems design using cutting edge processors and hardware accelerators at the AITC and supports the AO group for the development of a comprehensive software stack for AO RTC. This work will be done in worldwide collaboration with major observatories, industrial and academic partners.

## Position Dimension & Relationships:

The AO Real-Time Software engineer will be responsible for the development of core software packages supporting this major real-time computing platform, as part of the operations team, responsive to the Instrumentation Scientist. The engineer will maintain a technological platform including a standardised testing facility and a set of common computing hardware and software building blocks. On top of this, the engineer will develop real-time software packages and associated documentation to be delivered as part of instruments contracts.

## Role Statement:

Under the broad direction of the Adaptive Optics Group Lead, the AO R&D Software Engineer will:

1. Perform software engineering work requiring individual judgment and initiative in the application of best-practice software engineering techniques and methods, including but not limited to developing software engineering solutions for the adaptive optics real-time pipeline including computing kernels, data interfaces, user interfaces and process sequencing, management and monitoring.

2. Maintain an awareness of, and capability, in their field of engineering expertise applying best-practice techniques and methods in the context of prototype and one-off constructions, and an awareness of relevant state-of-the-art technologies that might be applied to astronomical or space research.

3. Participate in engineering studies and the evaluation of systems, designs and novel concepts, delivering within financial and project planning estimates.

4. Participate in the manufacture and integration of (elements of) instruments and systems.

5. Provide specialist technical advice to a variety of stakeholders as appropriate.

6. Provide coding and performance tuning of critical software blocks in the AO pipeline. Develop software that meets the specific requirements of external customers.

7. Maintain the School's existing production software used for supporting the School's research program.

8. Comply with all ANU policies and procedures, in particular those relating to work health and safety and equal opportunity.

9. Perform other duties as requested, consistent with the classification of the position and in line with the principle of multi skilling.

**SELECTION CRITERIA:**

1. Degree or post-graduate qualifications and extensive relevant experience or an equivalent combination of experience and education/training.
2. Extensive knowledge of, and experience with, the design, production and testing of software systems in a scientific/technical environment.
3. Extensive experience with object oriented software development methodologies with language experience including C/C++ development, Python 2 & 3 experience and HPC experience including MPI, GPU programming, multi-threaded programming. Experience developing end-user applications using libraries such as Qt will be highly regarded.
4. Experience developing software systems in a multi-threaded heterogeneous distributed environment.
5. Demonstrated ability to solve problems and follow technical and project management protocols. Experience developing software for real-time systems.
6. Demonstrated capacity to work effectively as a team member of a multi-disciplinary team using best practice engineering protocols. Well-developed interpersonal and liaison skills.
7. Demonstrated ability to document work, present their work orally and prepare project review documents and presentations. Demonstrated ability to set priorities, meet deadlines and quickly adapt to new environments.
8. A demonstrated understanding of equal opportunity principles and policies and a commitment to there application in a university context.

| **Supervisor Signature:** | | **Date:** | |
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| Printed Name: | | **Uni ID:** | |