



W. M. KECK OBSERVATORY
On the summit of Mauna Kea, Island of Hawai'i

CONTROL SYSTEMS ENGINEER

The W. M. Keck Observatory operates the world's two largest optical/infrared telescopes located on the summit of Mauna Kea on the Big Island of Hawaii. The Observatory is seeking a Control Systems Engineer to work on adaptive optics, especially the Observatory's next generation adaptive optics system (NGAO). Both telescopes are equipped with an AO system which is routinely used in both Natural and Laser Guide Star (LGS) AO modes. These systems have been extremely productive scientifically. New, more capable, systems are currently in design and development including an LGS AO upgrade to one telescope and a Next Generation AO (NGAO) facility designed for even higher Strehl ratios, sensitivity and sky coverage.

This position is responsible for developing, deploying and optimizing the control software for the observatory's NGAO systems. The candidate is expected to have a working knowledge of control theory and proven experience in developing and integrating distributed real time control software solutions for engineering or scientific applications with involvement in all aspects of the software life cycle from specification through deployment. A working knowledge of adaptive optics systems is highly desirable.

The ideal candidate should be a motivated, self-starter who can collaborate effectively across disciplines in a fast paced environment. Incumbent is expected to have sound knowledge of modern software engineering practices. This position is under the general supervision of the Software Engineering Manager with additional technical direction from the Optical Systems Manager.

Minimum requirements and skills for this position include: Five years experience in development and maintenance of distributed real-time embedded systems for engineering or scientific applications; Bachelor of Science or equivalent in Computer Science, Electrical Engineering, Physics, Mathematics or other relevant engineering or science field; Practical understanding of control theory with experience optimizing control systems; Hands-on experience with real-time operating systems and Experience implementing complex automation controls (such as device control, motion control and sequence control) in a scientific or industrial setting.

This is a regular position with a competitive, comprehensive benefits package including relocation assistance and private school (K-12) tuition support for dependent children. Salary is dependent upon qualifications and experience. The position is opened until filled. Employment is conditional on successful completion of drug tests and background check. Mail or fax resumes, references, and salary history to: Control Systems Engineer, WMKO, 65-1120 Mamalahoa Highway, Kamuela, HI 96743; Fax (808) 881-3696 or employment@keck.hawaii.edu. Additional information about WMKO and this position may be found on our web site at www.keckobservatory.org. EEO/M/F/D/V

POSITION DESCRIPTION

POSITION TITLE:	Control Systems Engineer	DEPARTMENT:	Software
INCUMBENT:		FLSA STATUS:	Exempt
REPORTS TO:	Software Engineering Manager	MEMBER:	
SUPERVISES:	N/A		

SUMMARY:

This position is responsible for developing, deploying and optimizing the control software for the observatory's next generation adaptive optics (AO) system. The candidate is expected to have a working knowledge of control theory and proven experience in developing and integrating distributed real time

control software solutions for engineering or scientific applications with involvement in all aspects of the software life cycle from specification through deployment. A working knowledge of adaptive optics systems is highly desirable.

The ideal candidate should be a motivated, self-starter who can collaborate effectively across disciplines in a fast paced environment. Incumbent is expected to have sound knowledge of modern software engineering practices. This position is under the general supervision of the Software Engineering Manager with additional technical direction from the Optical Systems Manager.

ESSENTIAL FUNCTIONS:

1. Provide technical leadership in the development and integration of AO control systems
2. Specify, design, integrate, and test real-time software to implement the AO control systems and optimize the overall system.
3. Participate in the hardware/software integration and test of all major AO subsystems in the laboratory and at the telescope to assure the subsystems function properly.
4. Provide technical support during the commissioning of AO system upgrades.
5. Provide software documentation and assist in developing end-user documentation for operations handover to assure updated and accurate reference documentation is available when needed.
6. Respond to questions and perform troubleshooting to provide end-user support for AO software, at times out of regular hours.
7. Provide highly effective collaboration across disciplines. This includes working with software, electronic and opto-mechanical engineers as well as scientists at the observatory and external collaborators at other institutions.
8. Take ownership and responsibility for the assigned systems engineering tasks of the project.
9. Work effectively with coworkers and others by sharing ideas in a constructive, positive manner; listening to and objectively considering ideas and suggestions from others; keeping commitments; keeping others informed of work progress and issues; addressing problems and issues constructively to find mutually acceptable and practical solutions; and respecting the diversity of the WMKO workforce in actions, words, and deeds.
10. Maintain commitment to a high standard of safety, comply with all safety laws and WMKO safety policies/rules, and report actual and potential safety violations to appropriate supervisory or management personnel to further WMKO's core value of safety.

OTHER DUTIES:

1. Perform other duties consistent with the scope of the position, as specified by the Software Engineering Manager.

Minimum Qualifications:

Education and Experience

1. Five years experience in development and maintenance of distributed real-time embedded systems for engineering or scientific applications.
2. Bachelor of Science or equivalent in Computer Science, Electrical Engineering, Physics, Mathematics or other relevant engineering or science field.
3. Practical understanding of control theory with experience optimizing control systems.
4. Hands-on experience with real-time operating systems.
5. Experience implementing complex automation controls (such as device control, motion control and sequence control) in a scientific or industrial setting.

Skills

1. Broad knowledge of modern software engineering practices.

2. Competency in Unix, C, and at least one domain specific language (such as MatLab, IDL, LabVIEW, Function Block),
3. Excellent written and oral communication skills.
4. Ability to work independently and as a member of a team.
5. Demonstrated ability to work collaboratively across disciplines
6. Strong applied mathematical and statistical skills.
7. Problem solving—the individual identifies and resolves problems in a timely manner and gathers and analyzes information skillfully.
8. Interpersonal Skills—the individual maintains confidentiality, remains open to others' ideas and exhibits willingness to try new things.
9. Oral communication—the individual speaks clearly and persuasively in positive or negative situations, demonstrates group presentation skills and conducts meetings.
10. Written Communication—the individual edits work for accuracy and correctness, presents technical data effectively and is able to read and interpret written information.
11. Planning/organizing—the individual prioritizes and plans work activities, uses time efficiently and develops realistic action plans.
12. Quality control—the individual demonstrates accuracy and thoroughness and monitors own work to ensure quality.
13. Adaptability—the individual adapts to changes in the work environment, manages competing demands and is able to deal with frequent change, delays or unexpected events.
14. Dependability—the individual is consistently at work and on time, follows instructions, responds to management direction and solicits feedback to improve performance.
15. Safety and security—the individual actively promotes and personally observes safety and security procedures, and uses equipment and materials properly.

Other Requirements

1. Willingness to commit to WMKO core and cultural values. Core Values: Safety, Integrity, Respect, Discovery and Service. Cultural Values: Education,/Learning, Communication, Teamwork, Rewarding Work Environment, Excellence and Community Involvement.
2. Willingness to stay current with changing technology.
3. Willingness and ability to work some nights and weekends.
4. Valid driver's license.

Desirable Qualifications:

1. Experience in AO systems and AO simulation.
2. Experience using O-O paradigm in delivering software based solutions
3. Competency in Java or C++
4. Experience programming in distributed control frameworks such as EPICS.
5. Experience with camera interfaces and image analysis software
6. Demonstrated ability to provide leadership across technical disciplines, to energize and persuade others and strive for excellence.
7. Project management skills
8. Experience programming digital signal processors
9. Experience at an astronomical observatory.
10. Advanced degree in a relevant technical field.

Incumbent

Date

Supervisor

Date