



Zoomlion Heavy Industry N.A., Inc.

Sr. Control Systems Engineer

Department: Engineering

FLSA Status: Exempt

Grade/Level: Senior

Job Type: Regular

Work Schedule:

Weekdays Monday through Friday unless traveling.

Hours are flexible to meet project needs.

Job Status: Full Time

Reports To: Engineering Manager, Control Systems

Amount of Travel Required: up to 15%

Positions Supervised: None

POSITION SUMMARY

Lead the research, definition, and development of software modules for applications used in a variety of off-highway, industrial, agricultural, and heavy equipment construction machinery. Develop and review requirements and design specifications, lead design and code reviews, propose and evaluate designs, assign tasks to junior engineers, and model and test complex control algorithms. Develop and improve our techniques of software engineering design processes and best practices. Mentor junior engineers and collaborate with other engineering disciplines to successfully complete development projects on time and on budget.

ESSENTIAL FUNCTIONS

Reasonable Accommodations Statement

To accomplish this job successfully, an individual must be able to perform, with or without reasonable accommodation, each essential function satisfactorily. Reasonable accommodations may be made to help enable qualified individuals with disabilities to perform essential functions.

Essential Functions Statement(s)

- Understand a wide variety of control system designs, challenges with hard real-time deadlines, hardware interfaces, and MatLab/Simulink modeling skills.
- Lead cross-functional design teams to evaluate and identify solutions to problems, develop review, and approve high-level requirements, review, and approve design specifications based on requirements, and ensure engineered solutions meet the specifications.
- As a leader, communicate team development progress, challenges, and roadblocks with the design team and the project leaders.
- Supervise the development of test cases to valid control software. Review the results.
- Develop software to monitor control signals, implement algorithms, and measure process variables such as temperatures, pressures, and positions.
- Ensure conformance to design and equipment specifications and compliance with operational and safety standards.
- Define and follow accepted best practices for software development and source code archival.
- Leads software design reviews, code reviews, and software DFMEA activities for major product development initiatives.

- Understands source code archival best practices within the confines of a development team.
- Investigates software tools and obtains licenses for use.
- Understands electrical systems, harnessing, wiring, and component selection in a control system or industrial machine.
- Define and follow accepted best practices for software and hardware development,
- Able to write documents and create diagrams describing complex systems effectively and clearly.
- Estimate effort required to complete project tasks to assist project managers with project plan generation for the development team.
- Drive development process best practices through continual improvement.

POSITION QUALIFICATIONS

Competency Statement(s)

SKILLS & ABILITIES

Education: Bachelor's degree (four-year college or technical school)
 Required field of study: Electrical, Electronics, Mechatronics, Computer Engineering
 A Master's degree is a plus, Master's degree in Controls is a big plus

Experience: Ten plus years in control system design and development

- Designing electronic controls for hydraulic systems or industrial controls.
- Control of cranes, mobile elevated work platforms, excavators, tractors, or combine control software is highly preferred.
- Developed software for real-time machine control or vehicle controls and automation.
- Modeling and simulation skills: Proficient in using modeling tools and simulation software, such as MATLAB/Simulink to create system models and analyze control system performance.
- Experience with system identification techniques.
- Simulation of software using software in the loop and hardware in the loop techniques.
- Strong knowledge of control theory: Deep understanding of PID control techniques,
- PID tuning methods, stability analysis, and anti-windup mechanisms. familiarity with advanced control strategies, such as adaptive control or model predictive control, is a plus.
- A working knowledge of wireless and wired communications technologies, protocols, and applications.
- Knowledge and involvement with requirement generation and approval.
- Demonstrated project leadership and mentoring of junior engineers.

Computer Skills: Microsoft Office 360:

- Outlook, Word, Excel, PowerPoint, SharePoint, and Visio
- Able to download and install various software packages or tools for evaluation

Certifications & Licenses: None required.

Other Requirements:

- Familiar with Matlab, Simulink, Simscape and Python.
- Understands all phases of the product development lifecycle: requirements analysis, architectural design, design and development, implementation, validation testing, and production release.
- Estimation and observer experience: Proficiency in developing estimators and observers, such as Kalman filters or Luenberger observers, to estimate system states and compensate for disturbances. Experience with sensor fusion and filtering techniques is advantageous

PHYSICAL DEMANDS

N (Not Applicable) Activity is not applicable to this position.
O (Occasionally) Position requires this activity up to 33% of the time (0 - 2.5+ hrs/day)
F (Frequently) Position requires this activity from 33% - 66% of the time (2.5 - 5.5+ hrs/day)
C (Constantly) Position requires this activity more than 66% of the time (5.5+ hrs/day)

Physical Demands

Stand	F	Lift/Carry 10 lbs or less	O
Walk	F	11-20 lbs	O
Sit	F	21-50 lbs	N
Manually Manipulate	F	51-100 lbs	N
Reach Outward	O	Over 100 lbs	N
Reach Above Shoulder	O		
Climb	N	Push/Pull	
Crawl	N	12 lbs or less	O
Squat or Kneel	N	13-25 lbs	O
Bend	O	26-40 lbs	N
Grasp	O	41-100 lbs	N
Speak	F		

Other Physical Requirements

WORK ENVIRONMENT

Office environment in a controlled atmosphere building.