



SIMULINK Control Systems Engineer: REFERENCE SIMULINK2022

Location: Bristol, UK

About

At Zero Point Motion we are redefining the limits of inertial sensors to enable high precision positioning and navigation. Our mission is providing exquisitely low-noise readout of acceleration and rotation using cavity optomechanics in a hybrid micro-electro-mechanical systems (MEMS) and photonic integrated circuit (PIC) chip.

We're an early stage start-up founded in 2020 to commercialise technology invented by the CEO Dr Lia Li, with a founding team comprised of eminent semiconductor veterans. We operate a fabless business model, and are VC funded.

We are seeking enthusiastic technical engineers to join our team and shape our technology design, strategy, and workflow. Together we will bring aerospace/defence levels of sensor performance to commercial mass markets and transform indoor, autonomous and GNSS-denied navigation. Can you help us disrupt the inertial sensing market?

Zero Point Motion is based in Bristol, and supports virtual working practices where applicable.

Role Overview

Critical: Matlab Simulink experience

Take lead in the design, implementation, optimization and testing of new advanced control loop and signal processing algorithms for inertial sensors (accelerometers and gyroscopes). Your solutions will be implemented by our Applications engineer and Software engineer using a variety of platforms including embedded DSP, FPGA, ASIC and analogue systems. Critically, you will be responsible for the creation, validation and optimisation of Matlab Simulink models to analyse algorithm behaviour, and simulate studies for new signal processing solutions and techniques. This includes control blocks such as PID loops, PLLs, PWM etc and hardware emulation blocks provided by, or, guided by, our chip design and test team. Experience in inertial sensors is not critical, but control loop creation and analysis in other hardware related products, such as robotic control or mechanical stability control, will be required.

Initially you will improve and add to an existing Matlab/Simulink reference system architecture, from analysis of transfer models to the implementation of control strategies in hardware. You will liaise with the MEMS and photonics design teams for accurate modelling of the physical parameters for mechanics, detailed matching of electronic and electromagnetic elements of the mixed signal drive and sensing components. You will work directly with the hardware and software teams to transfer signal processing functions to FPGA platforms. That will including

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trade-offs and performance verification of the mixed signal and digital domains, combined with the development of simulation test environments.

The critical attributes we'll use to compare candidates

- Matlab Simulink experience. Technical questions will be asked, including a presentation for the final stage interview (3 stages in total).
- Experience of mapping mechanical and/or electromagnetic behaviours into simulation models
- An understanding of performance metrics in analogue systems such as amplifiers and current/voltage sources
- An understanding of low power design techniques and trade-offs
- Experience in control theory and signal processing concepts and digital filter applications (FFTs, FIR filters, etc)
- Use of lab equipment for tracing and analysing signal performance (not critical)

Must-have-skills

- Masters in Physics, Engineering, Mathematics, Computer Science or Electronics Engineering – highly confident in mathematics
- 2 years+ experience working in DSP algorithm systems modelling with hands-on experience of implementation and testing on FPGA and/or ASIC systems
- Strong background in Matlab/Simulink for mixed signal and digital control loop design, including analysis and verification methodologies
- An excellent understanding of designs and specifications of ADC/DAC systems and Sigma-Delta, Modulation/Demodulation, PLLs, PID's, Filter design
- Good understanding of the MIL, SIL and PIL concepts and their utilization as part of the Simulink Model-Based Design development cycle
- Practical experience of mapping simulation models to RTL on FPGA platforms and embedded DSP systems
- Experience performing system evaluation and characterization using bench test equipment including oscilloscopes, power supplies and vector signal analyzers.
- Experience with working within small engineering teams or research groups
- Demonstrate a strong discipline for thorough documentation
- Ability to distil and communicate scientific information effectively with the wider team
- Highly adaptable, good communication and interpersonal skills

Good-to-have-skills

- Real-time embedded C-code experience on ARM CPUs with understanding of DSP instruction sets
- Experience with embedded software design and implementation (ARM Cortex MCUs, C/C++), basic knowledge and experience with software architecture and preferably knowledge on micro sensors

Package

- Competitive salary
- Generous company package including share options, Royal London pension, and sick pay
- Flexible working arrangements

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Location & Travel

Zero Point Motion's office and lab space is located in the Bristol University Quantum Technologies Innovation Center amongst likeminded start-up companies. There will be a occasional travel throughout the UK and abroad for conferences, meetings and engineering visits.

Zero Point Motion is determined to foster belonging and empowerment at work. We are committed to providing a work environment where there's a zero-tolerance approach to discrimination, and everyone is treated with respect. Equity, diversity and inclusion are central to our mission and we strongly encourage candidates of all different backgrounds and identities to apply. If you need assistance or an accommodation due to a disability, please contact us.