Real Time Software Engineer

L'ENTREPRISE

BERTIN ALPAO, a subsidiary of the **BERTIN TECHNOLOGIES** group, is a high-tech company renowned for its innovation and expertise in adaptive optics (AO).

A world leader in this field, we design and produce a wide range of **deformable mirrors** (DM), wavefront sensors (WFS) and customized systems, specially designed for demanding applications such as space, astronomy, optical and quantum communications, ophthalmology, microscopy, microelectronics and laser applications. Thanks to our **unique technology**, we enable our users to correct optical aberrations in real time, thus obtaining very high-resolution images.

Over 90% exported, Bertin Alpao takes on multidisciplinary technological and scientific challenges in the service of international research projects. In particular, we have developed deformable mirrors for the world's largest telescope, and collaborated with the Nobel Prize-winning physics team Reinhard GENZEL and Andrea GHEZ, equipping a key instrument used for research into the Milky Way's supermassive black hole.

Our partners include prestigious players in the fields of research, such as **ESO** (European Space Observatory), **NASA** and **CNES**, and industry, such as Airbus, Thales and Safran...

Located in "Inovallée" in Montbonnot Saint-martin (38), in the heart of Europe's "Silicon Valley", we offer our 50 employees a unique working environment at the foot of the Alps.

Mission

We are seeking a highly motivated and experienced **Real-Time Software Engineer** to join our team and contribute to the development and maintenance of our A**daptive Optics (AO) Real-Time Computing Platform.** This platform is critical for achieving high-performance atmospheric turbulence correction, enabling real-time wavefront correction and image enhancement. The ideal candidate will possess a strong background in real-time software development, parallel computing, a profound understanding of adaptive optics principles, and a passion for optimizing performance-critical applications.

Your main Responsibilities:

- Design, develop, and implement real-time software for adaptive optics systems, including wavefront sensing, control algorithms, and data acquisition.
- Optimize software performance to meet stringent real-time requirements, ensuring low latency and jitter
- Develop and maintain software drivers and interfaces for various hardware components, such as cameras, deformable mirrors, and processing units.
- Implement and test classical and AI-based real-time control algorithms

- Collaborate with system and optical engineers to integrate software with complex adaptive optics systems.
- Develop and maintain comprehensive documentation for software design, implementation, and testing.
- Troubleshoot and debug real-time software issues, ensuring system stability and reliability.
- Participate in code reviews, testing, and integration activities.
- Contribute to the continuous improvement of software development processes and tools.

Profil recherché :

Qualifications:

- Bachelor's or Master's degree in Computer Science, Electrical Engineering, Physics, or a related field.
- Proven experience in real-time software development, preferably in an adaptive optics or similar domain.
- Strong programming skills in C/C++ and experience with real-time operating systems (RTOS).
- Familiarity with hardware interfaces and communication protocols (e.g., PCIe, Ethernet, Camera Link, CoaxPress).
- Understanding of adaptive optics principles, including wavefront sensing and control algorithms.
- Experience with high-performance computing and parallel processing techniques (e.g. GPUs) is a plus.
- Strong problem-solving and analytical skills.
- Excellent communication and teamwork skills.

Preferred Skills:

- Experience with specific adaptive optics software frameworks or libraries.
- Knowledge of astronomical instrumentation or laser systems.
- Experience with CMake, CTest, CPack, git, GitLab.
- Familiarity with scripting languages (e.g., Python, Matlab).

Do you speak and write fluent French and English?

Do you share our core values of courage, confidence, talent and team spirit?

Then don't hesitate and apply to us by sending your CV along with a cover letter highlighting your experience and interest in the position to recrutement@bertin.group.