

The Paul Scherrer Institute PSI is the largest research institute for natural and engineering sciences within Switzerland. We perform cutting-edge research in the fields of matter and materials, energy and environment and human health. By performing fundamental and applied research, we work on sustainable solutions for major challenges facing society, science and economy. PSI is committed to the training of future generations. Therefore, about one quarter of our staff are post-docs, post-graduates or apprentices. Altogether, PSI employs 2100 people.

The Paul Scherrer Institute operates one of world-wide five hard X-Ray free-electron lasers, SwissFEL. It is based on a 600 m long linear accelerator and generates ultra-short pulses of very intense hard X-Rays.

The performance of SwissFEL depends critically on hundreds of parameters of the linear accelerator, which determine the properties of the accelerated electron beam. The process of generating the X-Rays is highly non-linear, and optimizing the many parameters is very demanding.

For the Large Research Facilities Division we are looking for a

Trainee

Performance optimization of the free-electron laser SwissFEL

Your tasks

During the last years, an optimizer was used during the operation of SwissFEL which generated large sets of data of the optimization process. Your task will be to analyze the existing sets of data and to further extend the existing optimizer by additional optimization routines that will allow for a faster and more stable convergence. An example is the implementation of 'shallow learning', but many interesting options exist, and you will help trying out the most promising alternatives. You will learn about accelerators, free-electron lasers, data analysis, and multi-parameter optimization.

Your profile

- You study physics or computer-sciences (minimum 4 semesters)
- You have an interest in analyzing data, programming, and testing your work on the accelerator of SwissFEL
- Experience with programming in C++ and scripting languages such as Matlab or python is desired
- You are open-minded, communicative and enjoy working in an international team
- You have not yet completed your Master's thesis

We offer

Our institution is based on an interdisciplinary, innovative and dynamic collaboration.

The contract will be limited to 3 months.

For further information, please contact Dr Florian Löhler, phone +41 56 310 35 26.



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