

Postdoc in Machine Learning applied to segmentation of bio-medical data

Scientific framework. Biological materials, such as bone and skin, plant cell walls, or arthropod's cuticles, exhibit remarkable mechanical and functional properties which stem from their internal hierarchical structure. In our department, we use optical and electron microscopy as well as X-ray tomography techniques to probe the architecture of these structures, understand their role and contribution to material properties and investigate the underlying cellular production processes. This position addresses the practical issue of handling the volumetric data generated from these experiments and, in particular, how to identify (segment out) biological objects using machine learning algorithms.

Goal. We are looking for a highly motivated individual who is interested in developing machine learning research tools for recognizing the three-dimensional structure of biological objects from bio-medical data 3D image stacks. The work includes also basic graphical user interface development.

Your task will be to develop an appropriate Machine Learning framework and network architectures to perform 3D semantic segmentation of these datasets. The implementation will be performed in close cooperation with domain experts in the field of biological materials and of scientific computing GPU parallelization. Depending on your interest, the position will enable you to develop your parallel programming skills through implementing high-performance software using cutting-edge technology.

Your contribution will enable scientists across the globe to simplify and speed up the analysis and quantification of their datasets and provide a tool to crucially improve the statistical relevance of the scientific statements that can be drawn from them.

Profile. The applicant should hold a PhD in Physics, Biophysics, applied Mathematics, Computer Sciences or a similar subject. Experience in image processing and analysis as well as Python programming language is required. Candidates with experience in machine learning, deep learning, and at least one of the major software frameworks (e.g. Tensorflow, Pytorch, ...) will be preferred. Familiarity with fundamental concepts in the fields of cell biology and biological material is considered a plus.

Institution and environment. The successful candidate will be primarily associated with the Department of Biomaterials at the MPIKG (based in Golm, near Potsdam, Germany) and will be working in an exciting environment, across several different fields, in close collaboration with scientists of the department. Part of the work will be done in collaboration with the MPCDF which provides access to cutting-edge high-performance computational infrastructures and in-depth know how in Machine Learning and parallel computing.

Duration and Salary. The full time position starts as soon as possible and is limited for a maximum period of two years. Salary will be based on experience according to the German TVöD.

To apply. Email a motivation letter, a CV and at least one recommendation letter to luca.bertinetti@mpikg.mpg.de before the 15th of January 2020. For further questions please contact Dr. Luca Bertinetti (luca.bertinetti@mpikg.mpg.de).

The Max Planck Society is committed to increasing the number of individuals with disabilities in its workforce and therefore encourages applications from such qualified individuals. Furthermore, the Max Planck Society seeks to increase the number of women in those areas where they are underrepresented and therefore explicitly encourages women to apply.