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## **Internship position in Applied Mechanics on meshing XRT tomograms**

Uppsala University, Department of Materials Science and Engineering

**Full-time internship for five to six months, starting as soon as possible or as agreed upon.**

**The Department of Materials Science and Engineering** aims to be an environment for successful and valuable research and education with a focus on materials science solutions for important societal challenges. Our department is an exciting workplace with research in a broad technology-related area, from basic research to large-scale applied research, and with close contacts with students through the department's involvement in engineering and master's programs. Our research and teaching are conducted within seven divisions with different research focus.

Read more about us [here](#).

### **About the division**

The division of Applied Mechanics is part of the Department of Materials Science and Engineering at the Ångström Laboratory. At the division we work with both basic and applied research. The research is related to load-bearing materials and constructions and is based on both experimental investigations and numerical modelling. The aim is to be able to design materials and components with better mechanical performance. We also conduct extensive teaching in the field of applied mechanics within several engineering programs.

### **Research project**

The advertised position is tied to the project "Diffusion and damage during delignification of wood biomass(D4mass)" financed by Formas, which deals with the chemical delignification process, with a focus on advanced structural characterization and mass transport analysis. We aim to develop a predictive model that couples damage and diffusion phenomena and is based on realistic wood chip microstructure constructed with X-ray tomography (XRT) technique. The model can be applied to predict and optimize the processing parameters of chemical delignification for a wide range of applications, such as kraft cooking and producing delignified transparent wood.

We are now looking for an intern with interest in computational mechanics and/or X-ray tomography who is eager to work in an interdisciplinary project that contributes to resource-smart processes and sustainability. The intern will work closely with a postdoctoral researcher and the researchers involved in the project.

### **Duties**

You will work on developing a robust workflow for creating a mesh from XRT data of real wood microstructures. You will have the freedom to explore the different steps involved, from segmentation of the tomogram and the 2D meshing process to the 3D meshing stage. In the context of wood, you will

determine which steps can be automated. The mesh will then be used to perform a finite element simulation of the delignification process.

### **Qualification requirements**

This position requires to be study Mechanics, Materials Science and Engineering, Mechanical Engineering, or any related field. And it requires to have knowledge and experience in programming (Python).

We require very good oral and written skills in English.

Your internship will be related to the following areas:

- Mechanics,
- Finite element software, e.g. ANSYS, ABAQUS, COMSOL, FENICS.
- Mesh environment, e.g. MeshLab, ImageJ/FidJ, GMSH.
- X-ray tomography (XRT),
- Wood and cellulose materials.

We place great importance on your personal qualities, so you must be self-motivated and proactive.

### **Instruction for application**

Your application must include:

- A letter describing yourself, your goals and why you are a suitable candidate for this position.
- CV (max 1 page).

The application must be written in English. During the application, we will continuously read applications and call for interviews.

**For further information about the position, and to submit your application, please contact:** Postdoc researcher Nicolas Pistenon ([nicolas.pistenon@angstrom.uu.se](mailto:nicolas.pistenon@angstrom.uu.se)).