WoodEye AB: Recognition of defects on wood surfaces on the basis of optical scanning

WoodEye AB is a world leading provider of systems for scanning of wooden surfaces for production optimization in the wood processing industry. WoodEye develops scanners with a variety of sensors, including cameras and various types of lasers. Today the company has 30 years of experience in quality management in the wood industry and more than 550 scanner installations worldwide. The origin of the company is in research on computer-based image processing at Linköping University.

Scanners are used to identify various defects that are important for the production of wood material. An area of high priority for development within the company is further enhanced recognition of defects, and development of automatic adjustment of setting values for this purpose. This means that a new methodology based on statistical data and machine learning needs to be developed.

Job description
The preliminary objective of the research project is to develop a systematic methodology to consider material related variations, such that defects of importance for the production can be identified more accurately than possible today, even when large variations in the investigated wood material occur. In collaboration with WoodEye customers the doctoral student will collect material for certain types of defects, record data with a WoodEye scanner and develop and evaluate setting criteria and machine learning algorithms.

Expected results are that the setting of system parameters used for the optical scanning of wood, which today are set manually, can be performed in a quicker and more convenient manner, and that the accuracy of detections is thereby improved. Examples of relevant defects that need to be recognized is living and dead knots, rot, pith, cracks, various kinds of cross-grain, top rupture, compression wood etc. The results of this work are expected to be applied on three-dimensional modeling of timber pieces and for prediction of properties such as strength. A goal is thus also to show that accurate detection of defects, in combination with other information that may be collected by optical scanning, can improve the possibilities of optimizing the yield in the production of various products and predicting important engineering properties of timber.

As a doctoral student you will primarily engage in your research task and studies. To a limited extent, you are given the opportunity to work with e.g. education at the University or other projects within the company. Such work should not comprise more than 20 % of full working hours.

Subject area and location
Subject area for admission: Building Technology at Linnaeus University, Växjö, Sweden.

Location: The doctoral student divides his/her time between the company WoodEye in Linköping and Linnaeus University in Växjö.

Entry requirements
A person meets the general entry requirements for third-cycle programmes if he or she:

- has been awarded a second-cycle qualification
- has satisfied the requirements for courses comprising at least 240 credits of which at least 60 credits were awarded in the second-cycle, or
• has acquired substantially equivalent knowledge in some other way in Sweden or abroad.

Specific prerequisites for admission to graduate studies in building technology are required, which corresponds to a minimum of 90 higher education credits in the subject building technology or in subjects related graduate studies at the doctoral level, or equivalent knowledge acquired in some other manner either in Sweden or abroad, and a good command of Swedish and/or English.

**Assessment grounds**

You have a master degree in structural engineering, mechanical engineering, engineering physics, applied mathematics, computer science or another corresponding technically oriented program with major elements of computation. You have good communication skills and can express yourself well orally and in writing in English.

Additional qualifications for the position are in depth knowledge in one or several of the areas of machine learning, structural mechanics, numerical calculations, programming, statistics, and wood. Furthermore, experience of calculations within different fields of application is a merit as well as a good ability to communicate well orally and in writing in Swedish and/or other languages besides English.

We are looking for someone who has a curious and analytical mind. You have good interpersonal skills, want to take on large responsibility and want to complete tasks successfully.

**Conditions**

**Employer:** Linnaeus University, Växjö.

**Terms of employment:** Doctoral student position

Applications will be considered on a rolling basis, which means that applicants may be admitted before the application deadline.

**Wage:** according to established stages for doctoral student

**Collective agreement:** is applied, Villkorsavtalet

**Information**

Start date is requested from September, 1st, 2017, or per agreement.


Your application should include personal letter, CV and signed copies of documents containing grades of courses completed, signed copies of degrees awarded and proofs of the required basic qualifications and the other assessment criteria given above.

Applications will be considered on a rolling basis, which means that applicants may be admitted before the application deadline.

**For more information, please contact**

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_Welcome with your application!_