DYNAMIC ANALYSIS OF TIMBER FLOORS SUBJECTED TO WALKING

BACKGROUND
Timber floors are commonly slender structures with relatively low mass, which make them sensitive to dynamic loading. When modeling wooden floors, different methods may be used. A simple method is to model the floor as a one-dimensional beam. Alternatively, a more advanced approach may be used where the floor is analyzed in two dimensions according to plate theory. Full three dimensional (3D) models are often not feasible to use in a practical engineering context.

Timber floors can be manufactured in different ways, for example using cross laminated timber (CLT) elements. CLT elements are manufactured with several layers of laminations oriented with a 90-degree angle between the different layers which results in elements with significant strength and stiffness in two orthogonal directions.

OBJECTIVE AND METHOD
The aim of the Master's dissertation is to develop a methodology to be used for analysis of footfall induced vibrations in CLT floors. The objective for the Master's dissertation is to examine differences in the dynamic response between advanced 3D finite element (FE) models and simplified 2D FE models.

This dissertation is a continuation of the Master's dissertation by Johannes Wetterholt, titled Modelling cross-laminated timber floors in dynamic analysis – Eigenfrequency prediction. We are seeking two students that have taken advanced courses in both the FE method and in Dynamics.

OUR DIVISION
We at the Division of Structural Mechanics are driven by understanding engineering problems and conducting research that contributes to solving societal challenges. We offer a good study and work environment, good team spirit with dedicated employees and joint “fika” every day. We have a strong focus on high-quality teaching and research. We are proud to belong to a university that is ranked among the top 100 in the world and we enjoy the international environment in which we operate.