Master Thesis work - FEM analysis of TensionCam fasteners

Introduction

Bulten Group is one of the leading suppliers of fasteners to the international automotive industry.
The company's product range includes everything from customer-specific standard products to customized special fasteners.
The company also provides technical development, line-feeding, logistics, material and production expertise. Bulten offers a Full Service Provider concept or parts thereof.
The company was founded in 1873, has some 1,600 employees in sixteen countries and head office in Gothenburg. The share (BULTEN) is listed on Nasdaq Stockholm.
Read more at www.bulten.com.

Technology Background

In 2020 Bulten acquired a holding in the company TensionCam System AB, which is developing novel, digitalized solutions for clamp load control of bolted joints.

The TensionCam sensor technology for fasteners is based on measuring the deformation of the fastener head or nut side, and from this data calculate the clamping force in the bolted joint. The measurement is performed by a so-called Finger Print Sensor (FPS), that reads a circular pattern placed in a small cavity in the fastener. As the fastener is assembled and pre-tensioned, the circular pattern is deformed, and algorithms will be used to translate the deformation of the fastener head/nut side into clamp force.

Goal for the thesis

The deformation pattern of bolt heads and nuts is an area where very little literature and data exists, as most fastener calculations are focused on the deformation behavior of the bolt shank and thread. Furthermore, FEM as an analysis tool for evaluation of fastener behavior and performance in bolted joints is not used in the Bulten group.

Bulten is now aiming to expand the knowledge of bolt behaviour during service by utilizing FE analysis. The target is to optimize the performance of the TensionCam system and to create an understanding for how FEM tools could generate value for future development work within the Bulten group. Basically, starting up a new discipline within our Technology & Innovation department.

As a thesis worker in this project, you will work with both the Technology & Innovation department of Bulten and with the TensionCam development team. You will experience working in a fully agile environment and will have the opportunity to introduce FEM simulations as a way of working in the Bulten group.

Details:
• 20 weeks, flexible start date/spring /summer …..
• 30 ECTS / hp
• Location: BATC Arendal in Gothenburg with possible part time at Chalmers

Desirable expertise and skills

We are searching for 1-2 master-degree students with a good understanding of mechanical engineering and a passion for computational analysis.

You have a problem-solving attitude, good communication skills, and are fluent in English. Some experience in using ANSYS Mechanical is required.

What we offer

This is an opportunity to apply your theoretical knowledge in practice in a friendly and innovative company culture. At the same time, of course, it is a way for Bulten to connect with students and take advantage of new ideas and knowledge. You will make valuable contacts for the future, and Bulten has the opportunity to meet potential colleagues.

Apply with your CV, academic transcripts and a cover letter in English. We look forward to receiving your application.
Recruiting Manager Emmy Pavlovic, SVP Technology & Innovations, +46 31 734 59 40, will answer your questions.
Send your application to emmy.pavlovic@bulten.com