

Project Proposal – Bringing machine vision to everyday use in process industry

1. Introduction

At Beamex, we design, manufacture, and deliver calibration equipment and software to help our customers achieve safer and less uncertain world. Our products are trusted by many global brands, ranging from Google, NASA, Nestle to F1 teams. Beamex bMobile is our multi-platform mobile application for guided execution and documentation of field calibrations.

Beamex bMobile is an everyday tool for numerous calibration technicians all over the world. One use case for bMobile is to document the calibration results from the calibration. In many cases, this means manually reading values from instrument display and retyping them in bMobile. This type of manual data transfer is a tedious and error-prone process that the calibration technicians wish not to do.

We are currently exploring new ways to insert calibration data into bMobile. As a result of our previous product concepting project, we have tested using mobile device camera and machine vision to recognize and insert data to bMobile. After a successful Proof-of-Concept, we are planning to raise the bar to make scanning of results even more effortless for the calibration technicians.

Our aim is to utilize smart glasses to free the technician from holding and using the mobile device all the time. With AR capable smart glasses, the technician could scan, review, and accept calibration results while maintaining free hands to work on with the instruments.

2. Project goals

The main goal is to design and implement a machine vision software module that can be used with smart glasses to recognize and insert measurement values from measurement instruments. The machine vision, and the machine learning model behind it, is expected to be based on the previous Proof-of-Concept implementation. The main goal of the students is to transfer the machine vision capability to smart glasses and develop required user interaction with the smart glasses. Excellent user experience is an important part of the solution, and this is the part where we wish new and innovative ideas from the team.

3. Technologies

Required technology:

- Application should be implemented preferably with react-native and the application must be able to run on safety gear (e.g. hard hat) compatible smart glasses, like RealWear. Pure Android implementation can be considered too.
- A react-native based proof-of concept version with working camera functionality exists, that can be run on a smartphone, but not yet tested with RealWear platform.

The proof-of-concept can be used as base of application and to obtain a jump start with topic.

- We're confident that react-native can be used and native Android extensions can be made if needed.
- We can provide some support with react-native, but bit less with pure Android.

4. Requirements for the students

Familiarity with some degree to given technologies in chapter 3. Difficulty of the topic would be moderate.

5. Legal Issues

Intellectual Property Rights (IPR): The client gets all IPRs to the results.

Non-disclosure agreement (NDA): Standard Aalto university and/or client NDA.

Confidentiality: The client will share some confidential information with the students.

6. Client

Since its founding in 1975, Beamex has been a trusted partner for calibration excellence, helping its customers to continuously improve efficiency, ensure compliance, and increase safety in their operations. Beamex sets the industry standard with its way of working, its expertise and its innovative calibration technology that provides accurate measurements, reliable data, and traceability.

Beamex has a comprehensive ecosystem of calibration solutions that covers everything from field calibration to workshop calibration, calibration management, and services. Through the company's global reach, its products and services are helping to create a safer and less uncertain world for customers across more than 90 countries.

In this project, you will be working with our bMobile and product management teams. Juho and Lasse will be your primary contacts at Beamex. Juho will help you with the business and customer views, and Lasse with technical requirements and questions. We can assist the students a few hours per week.

Working space for the team can be negotiated, if needed. Beamex will provide necessary equipment like the smart glasses and test mobile devices.

Client representatives

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