



Challenge: Digital Ear - An automated anomaly detection in brewing machinery



Introduction

Imagine being responsible for the brewing process for one of the most influential liquids in the world. And no, it is not water, but the one and only beer. Your expertise goes beyond ingredients and recipes; there are several technological elements to it that need to be maintained. One of the ways to ensure a lasting life span of the equipment is using your ears. You must rely on your trained ears to detect subtle sounds from brewing machinery that might signal potential malfunctions. But what if you are tired, can they be as accurate and be present 24/7?

Who is behind the initiative:

Asahi Europe & International (AEI) is a subsidiary of Asahi Group Holdings, a Tokyo-listed global beer, spirits, soft drinks, and food company. We have a long history in Europe and operate 19 production facilities in eight different countries. Our global beer brands include iconic premium beers such as Pilsner Urquell, Kozel, Peroni Nastro Azzurro, Asahi Super Dry, and Grolsch.

Pilsner Urquell is a well-known international company as well as one of the most admired companies in the country. People usually think of Pilsner Urquell as the most popular beer in the Czech Republic, but they overlook our brand Kozel, which is the best-selling Czech beer in the world and has its headquarters in Velké Popovice. Another brewery is in Nošovice where Radegast is produced.

What is the challenge and project objectives?

- Listen closely: Build a system that can "hear" different sounds made by the machines.
- Understand what it hears: Teach your system to tell normal sounds from trouble signals.
- Talk to the brewers: Connect your system to their central control room for real-time alerts.

Interested student teams are asked to present the following key outcomes:

- Outcome 1: Improved anomaly detection accuracy and reduced false positives for timely intervention.
- Outcome 2: Enhanced operational efficiency and consistency.
- Outcome 3: Collecting data insights for predictive maintenance and optimizing brewing processes.

By implementing the One-Control-Room project, we aim to connect all brewing-related processes in one place dedicated to control and monitoring. While automation and digitalization are key, human expertise in detecting sound anomalies remains crucial for identifying potential equipment issues. Replacing human hearing with an automated system would significantly improve efficiency, consistency, and lifespan of our machinery through preventive maintenance.

Relevant considerations for the challenge / theme

As part of the challenge, we are planning to organize a visit to Velké Popovice Brewery on Thursday 18 April 2024, 2-4 pm (for the participating teams only!). Looking forward to your solutions!

Complementary questions and answers are available in [this document](#).

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