UNIVERSITÄT HOHENHEIM

Institut für Lebensmittelwissenschaft und Biotechnologie
FG Lebensmittelinformatik (150L) **Jun.-Prof. Dr. Christian Krupitzer**

Master‘s thesis/ Project work

Topic:

„Hand-held food spoilage detector“

Please note: The thesis must preferably be written in English, but can be written in German.

Motivation

We buy a variety of food items every week, but we also do not manage to consume all of it for several reasons – not sure if it is still good, one part is spoilt so what to do with the rest etc. Therefore, grocery bills in the US & EU have soared by 40% last year alone. Each US household throws away 30-40% of food per household per year [USDA] - that's €1500 of their annual grocery bill with similar numbers for Germany. Half of this is wrongly thrown away. We interviewed 208 households and > 90% of them wanted to save this money and/or reduce their food waste owing to sustainability in food consumption. They were passionate about the cause. Are you someone who feels this is a challenge you would like to solve with us and reduce household food waste by building a simple portable sensor device?

Goals

The aim of the thesis is to understand food spoilage patterns from a chemical and biological perspective of a selected number of fresh foods. An interest in using AI to augment the sensor device output, recognition patterns and scale it for consumer use is a plus point. The scope of the analyses and their evaluations, will be determined with the supervisors.
The tasks will consist of the following:

Literature review of the mechanism of food spoilage (microbial, chemical, physical) for 2 categories of food items – fresh fruits, fresh vegetables.

Creating a database of food spoilage patterns (end point determination of the food item) of several fruits and vegetables – focus on repeatability and sensitivity.

Testing 2-3 types of sensors for 3 representative food items in each category. The objective is to analyze the sensitivity and output of each sensor to determine specific spoilage patterns. Possible sensor types might include gas sensors, optical and Near-IR analysis, pH sensors, or microbial sensors and temperature and humidity environment sensors – the exact choice of sensors depends on the targeted results and sensors’ availability.

We offer

- **Work in close collaboration with a fast-pacing startup**
- **Opportunity to work towards a UN Sustainability Development Goal**

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