1st SERENADE Training School — Saarland University

The first training school of SERENADE, funded by the European Union, was held at the University of Saarland in Saarbrücken, Germany, from September 23rd to 28th, 2024. This training school brought together doctoral candidates, researchers, and project partners to explore innovative food safety and sensor technology solutions, emphasizing sustainable practices and interdisciplinary collaboration.



Participants of the 1st SERENADE Training School

Overview of the Training School

The training school offered a comprehensive program on essential sensor technology, food safety, and materials science topics. The sessions were designed to provide both theoretical knowledge and hands-on experience. Doctoral candidates presented their ongoing research, which led to meaningful discussions and potential collaborations—the week also included social activities, such as a visit to the historic Becker Tower, the city of Saarlouis, and the Völklinger Hütte, a UNESCO World Heritage site.

Monday—Food Safety

The opening day focused on introductions and food safety fundamentals. Key presentations included: Food Microbiology and Safety by R. Gurusamy: An exploration of experimental designs and early findings in food microbiology relevant to the project.

Fruits and Vegetables Experimental Design by K.M. Bantaculo: Discussion on the impact of various factors on food spoilage and safety. The day concluded with a city tour and dinner at City Center Saarbrücken.

Tuesday—Volatile Organic Compounds (VOCs) and Gas Sensing

Tuesday's sessions delved into volatiles and gas sensing principles, with notable presentations on: Basics of Gas Sensing by Andreas Schütze: Covering sensor principles, testing, and evaluation.

Volatile Organic Compounds (VOCs) by Vicente Ferreira: An in-depth look at VOCs and their implications in food safety and spoilage detection.

Wednesday—Advanced Sensor Systems and Social Dinner

Wednesday's sessions covered multi-sensor systems and advanced sensor processing techniques essential for real-world applications: Multisensor Systems (Electronic Nose) by Christian Bur: Exploring applications of electronic noses in detecting gases and indoor air quality.

Dynamic Sensor Operation and Impedance Spectroscopy by H. Imran: Discussing temperature cycling and impedance spectroscopy for enhanced sensor performance. A hands-on workshop on processing the raw sensor data with machine learning was also conducted by L. Masi and H. Imran.

The day concluded with a social dinner, where participants enjoyed meaningful discussions and camaraderie. The social program in St. Ingbert included a city tour and a visit to the Becker Tower, where participants enjoyed panoramic views of the region. This outing provided a great way for participants to connect and reflect on the intensive sessions.



Visit to the Becker Tower



Enjoying a French Cuisine Dinner at Restaurant Jerome

Thursday—Materials Science

Thursday's sessions transitioned into material science, crucial for understanding food packaging impacts: Polymer Materials and Bioplastics by Giovanni Lucchetta and Alberto Marcolongo: Analyzing the potential of biodegradable materials for sustainable packaging.

Injection Molding and Recycled Plastics by S. Hadi and Dirk Nelen: Focusing on recycling challenges and production processes in foodgrade materials.

Friday—Wrap-up and Future Directions

The final day included discussions on project collaboration and demonstrations of sensor solutions:

Environmental Hotspots in Food-Grade Materials by Dirk Nelen: Insight into lifecycle analysis of food-grade materials.

Smart Odor Analytics by Tilman Sauerwald: Showcasing AI-driven techniques for interpreting sensor data.

The day ended with a discussion on the progress of the project and future planning. All participants contributed to the discussion resulting in very fruitful conclusions.

Saturday—Sightseeing in Saarland

Although the training school ended officially on Friday the participants from all across Europe decided to explore the beautiful city of Saarbrueken and its surrounding areas, where participants visited the Völklinger Hütte, a UNESCO World Heritage Site known for its impressive blast furnaces and rich industrial history. This marked a memorable end to an insightful week.



At the iconic Völklinger Hütte-UNESCO World Heritage Site

Conclusion and Future Outlook

The 1st SERENADE Training School successfully provided a platform for knowledge sharing and networking among researchers dedicated to food safety and sustainable technology. Participants left with new insights and ideas for future collaboration, particularly in materials research and sensor technology. We look forward to seeing the innovative solutions these researchers will develop as part of the SERENADE project.