

## TOPIC OF A COMPETITION PROMOTING STUDENT ENGAGEMENT IN SCIENTIFIC ACTIVITIES

**Topic:** Explainable AI for Investigating ECG Changes During Healthy Aging

**Goal:** The goal of this project is to explore how electrocardiogram (ECG) signals change with age using explainable artificial intelligence techniques to identify key patterns and features associated with healthy aging.

**Short description (max. 2000 characters):** This project is inspired by the study “*Using explainable AI to investigate electrocardiogram changes during healthy aging — From expert features to raw signals*” (<https://doi.org/10.1371/journal.pone.0302024> ). Students will replicate the models and methodology presented in the paper, applying both traditional machine learning algorithms and deep learning approaches to analyze ECG data. They will then attempt to improve the model’s performance or interpretability, for example by optimizing hyperparameters, enhancing feature extraction, or testing alternative explainable AI techniques.

**Supervisor researcher/lecturer:** prof. dr. Dmitrij Šešok