

**Prof. dr Dusanka Boskovic,
University of Sarajevo, Bosnia and Herzegovina
Director IEEE Region 8**

Data, Devices, and Design: Building Human-Centered Systems from Biomedical Signals

**Mini Symposium 2026 - Recent Advances in Intelligent Engineering
Obuda University, Budapest, Hungary**

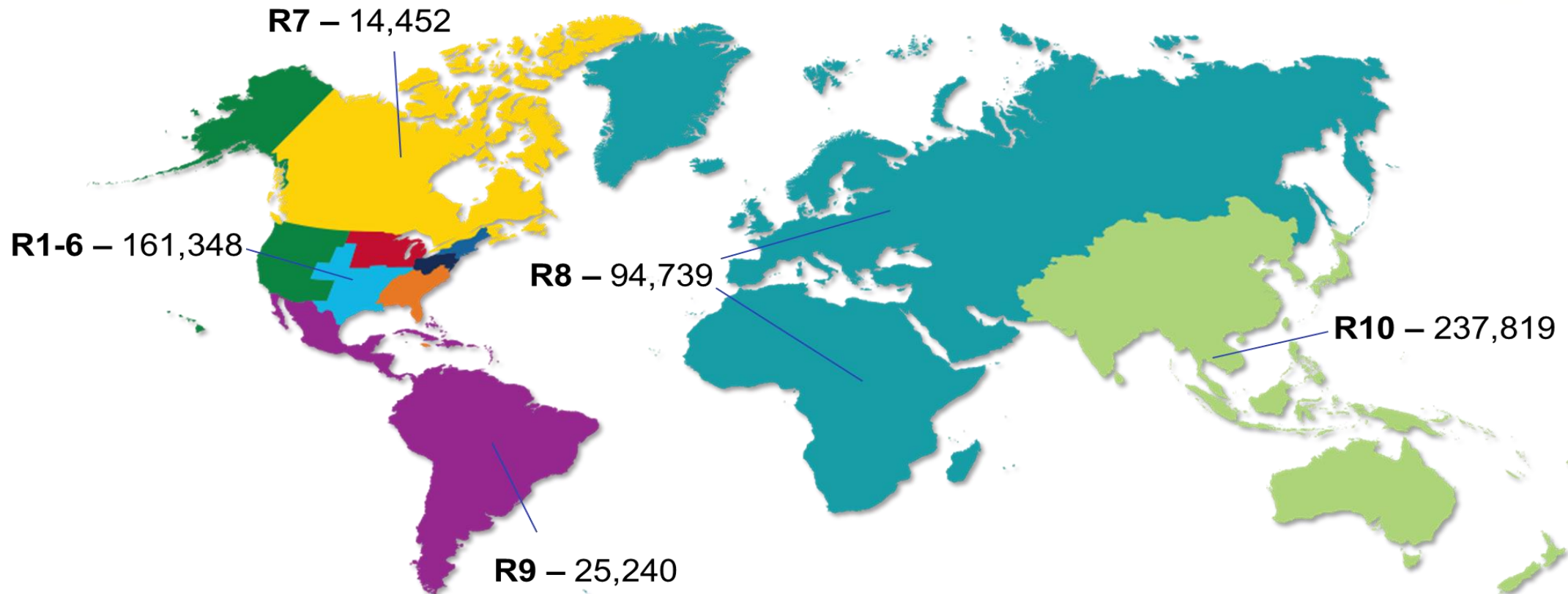
Topics

- ▶ Basic facts about IEEE and Region 8
- ▶ My career timeline
- ▶ Answering research challenges when faced with limited resources
- ▶ Data, Devices and Design
- ▶ Human Centered Approach

Basic facts about IEEE and Region 8



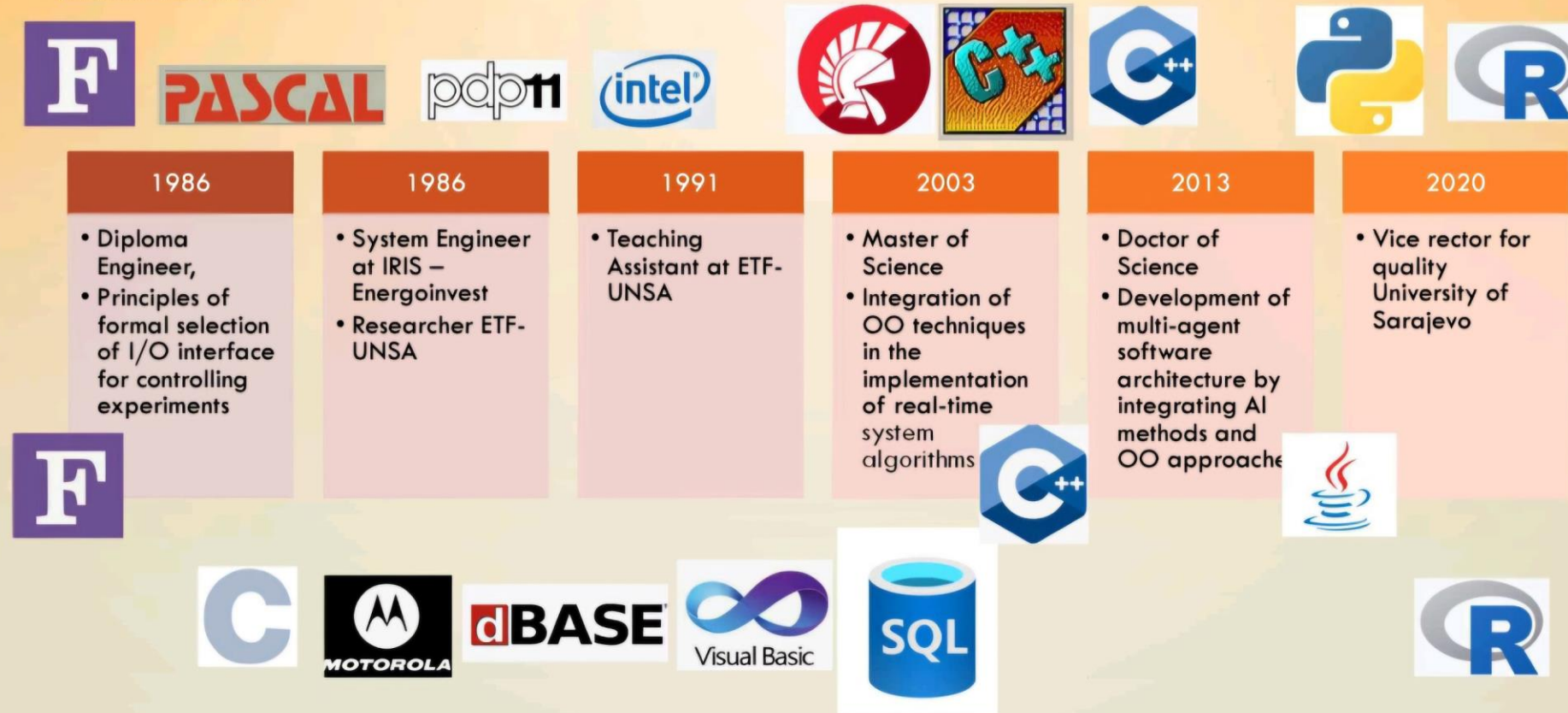
TOTAL 31 December 2025 MEMBERSHIP: 533,598



Timeline

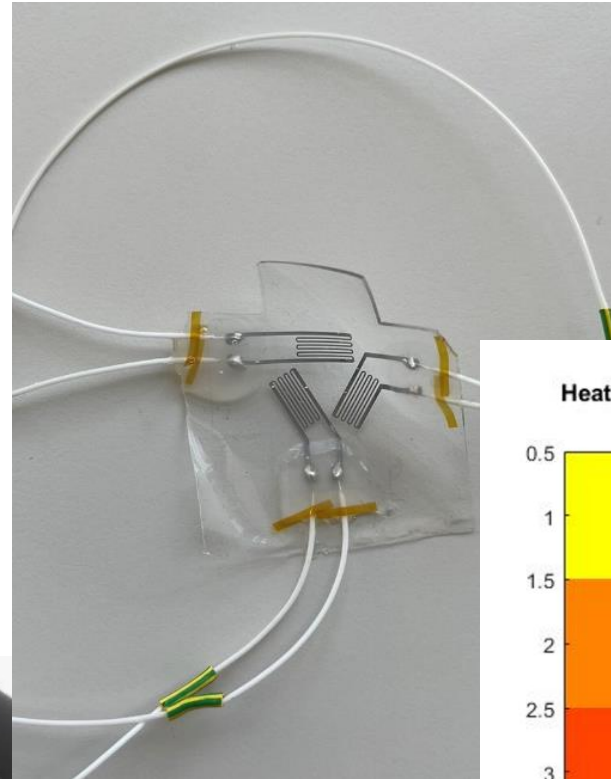


Dušanka Bošković, University of Sarajevo

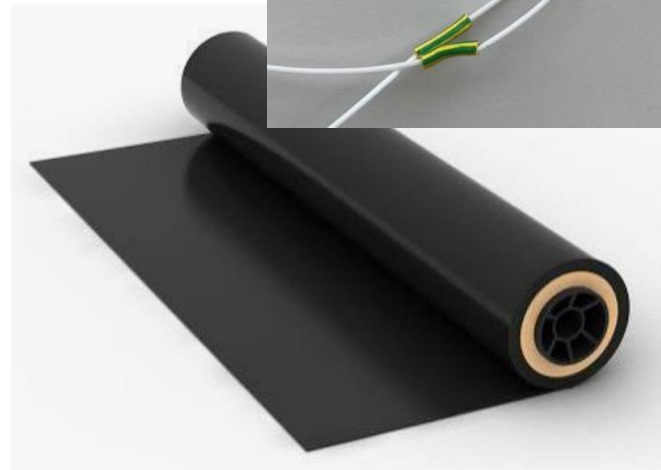
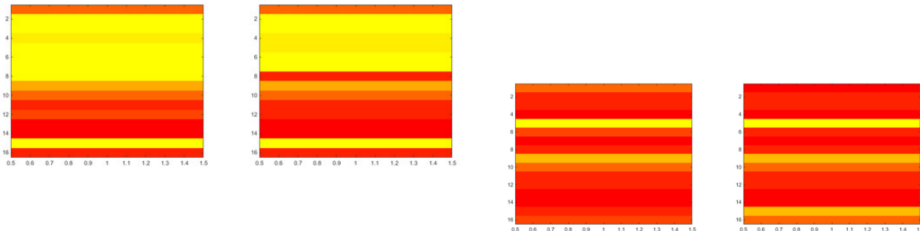
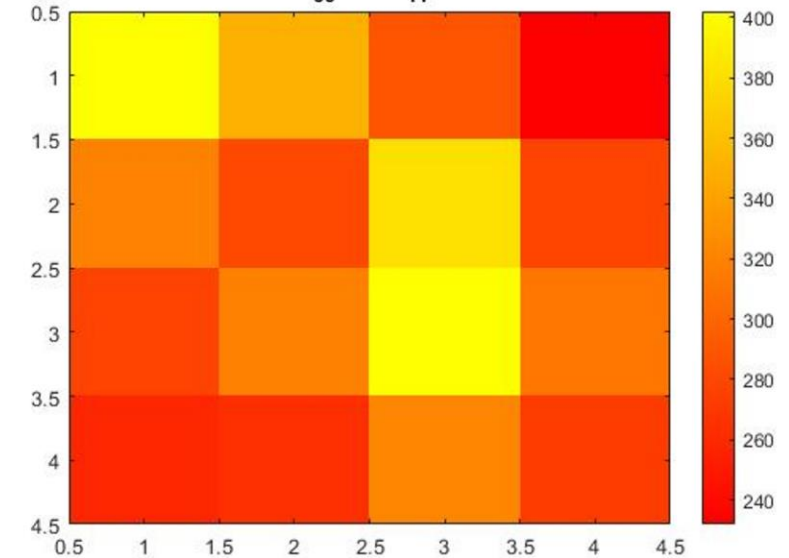


Research challenges - limited resources

► Data, **Devices** and Design

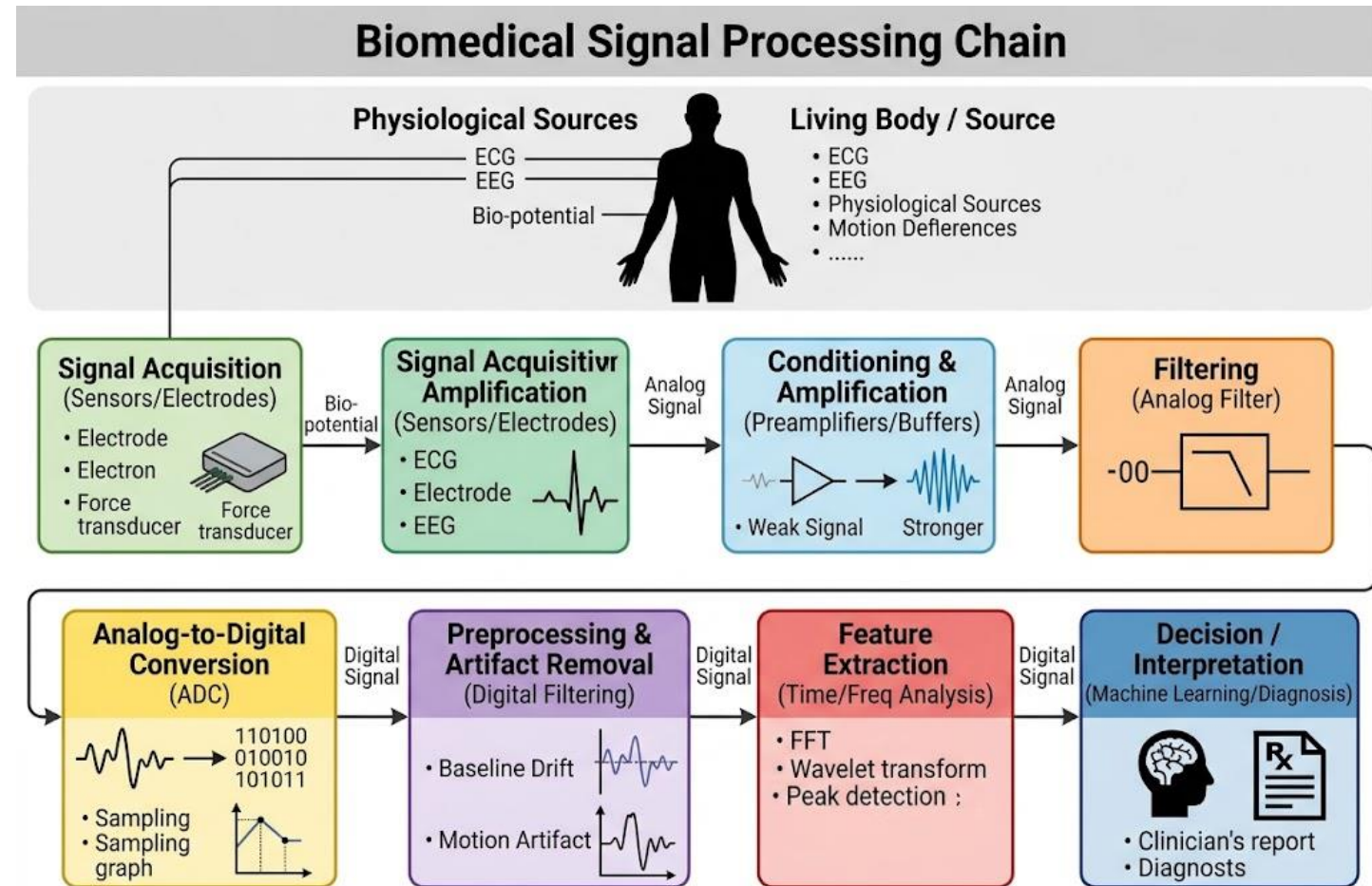


Heatmap of 4x4 matrix when force of 30 N is applied to sensors R_{33} and R_{11} with ZPM



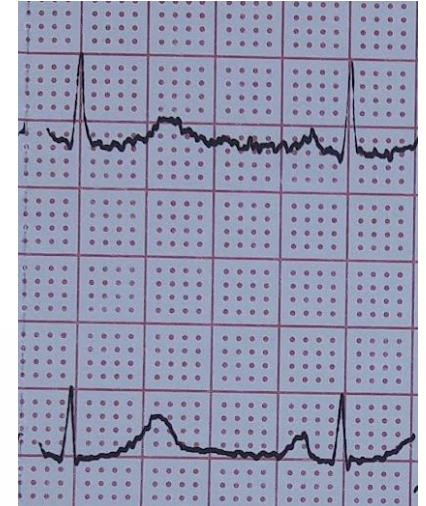
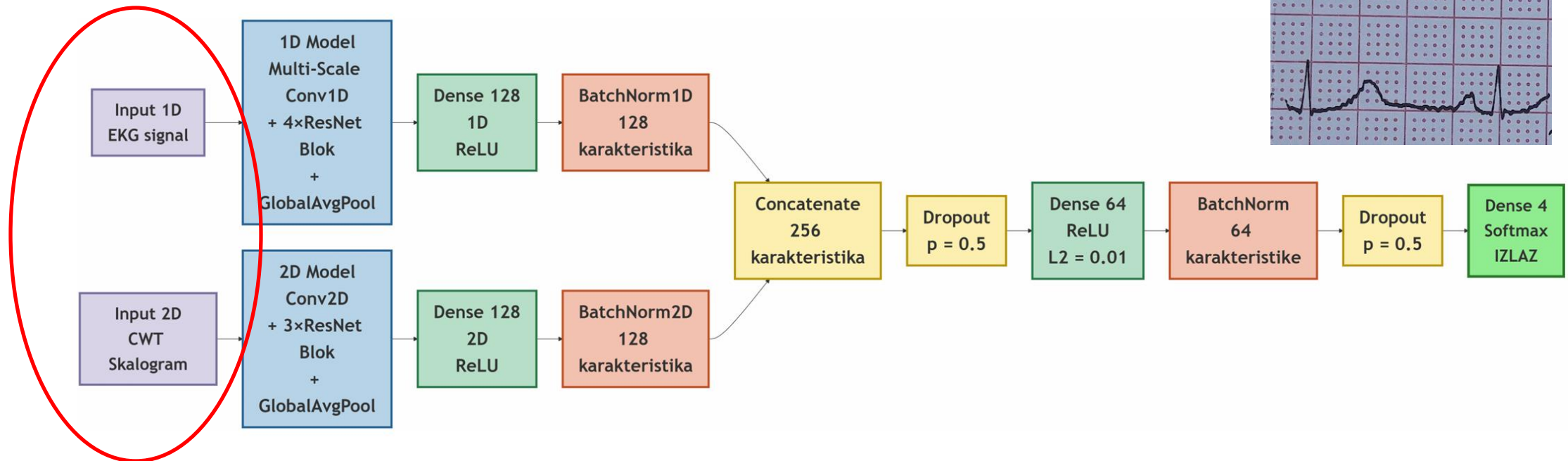
Data, Devices and Design

- ▶ Preprocessing and artefacts removal
- ▶ Feature extraction
- ▶ Interpretation



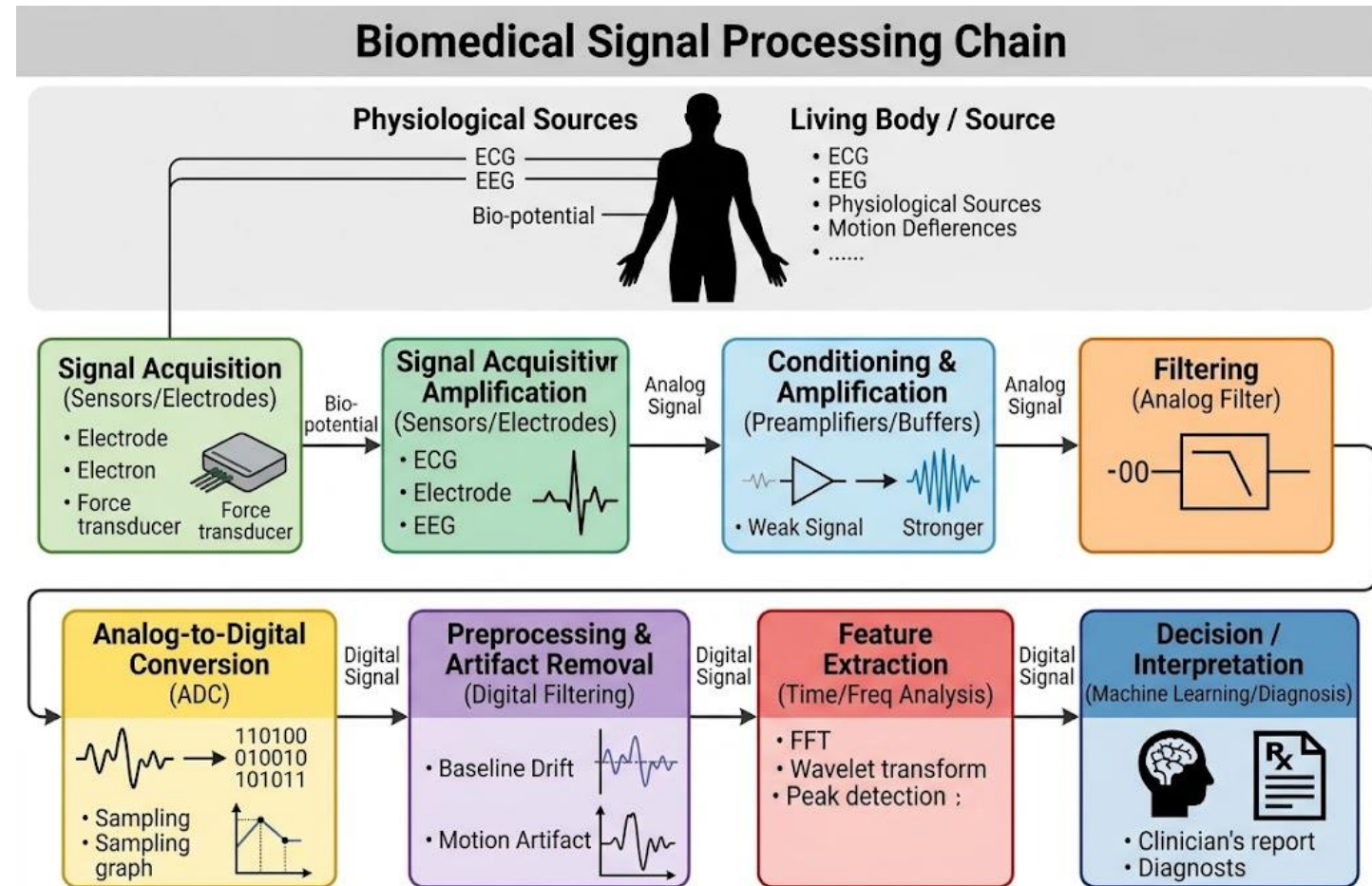
Data, Devices and Design

- Interpretation – classification problem – AI solutions



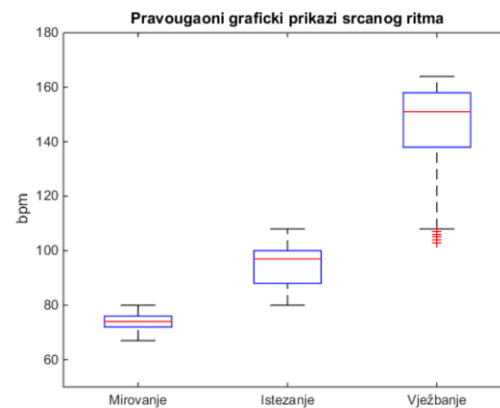
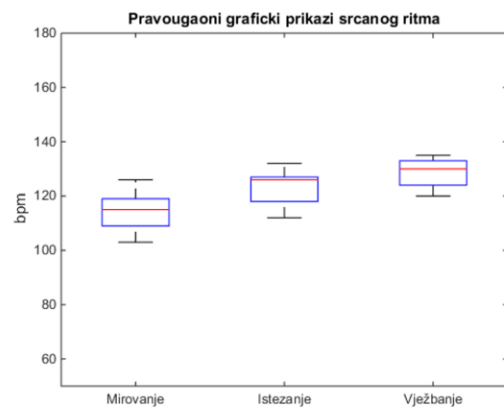
Data, Devices and Design

- ▶ Preprocessing and artefacts removal
- ▶ Feature extraction
- ▶ Interpretation

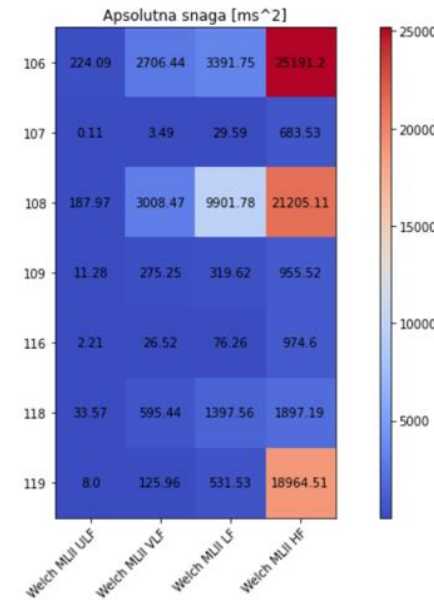


Data, Devices and Design

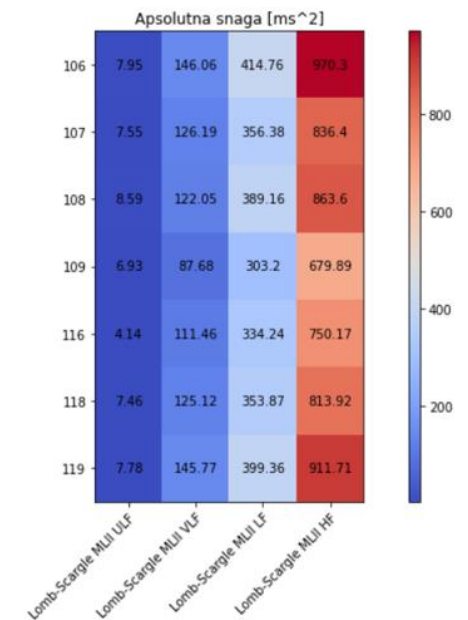
- ▶ Feature extraction – feature engineering
- ▶ Features: choosing data types, looking for redundancy, estimating dependencies, estimating importance
- ▶ Signals - Preprocessing and artefacts removal



Welchova metoda (kubična interpolacija)

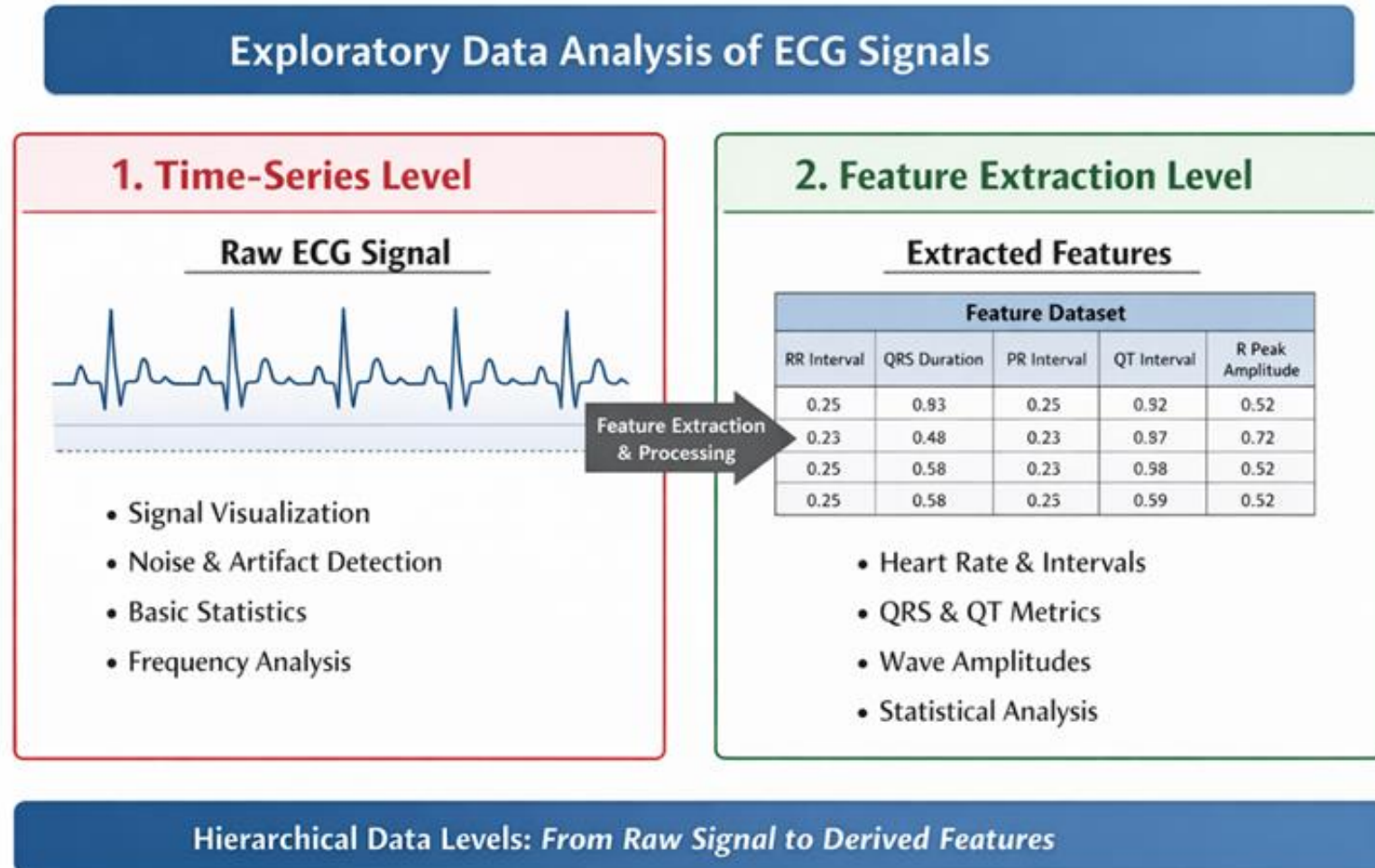


Lomb-Scargle metoda



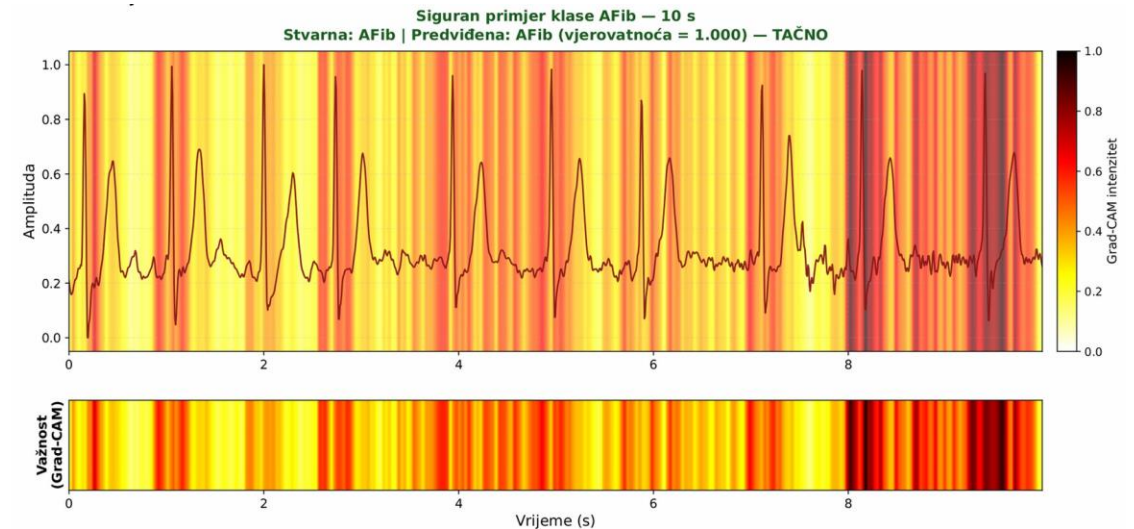
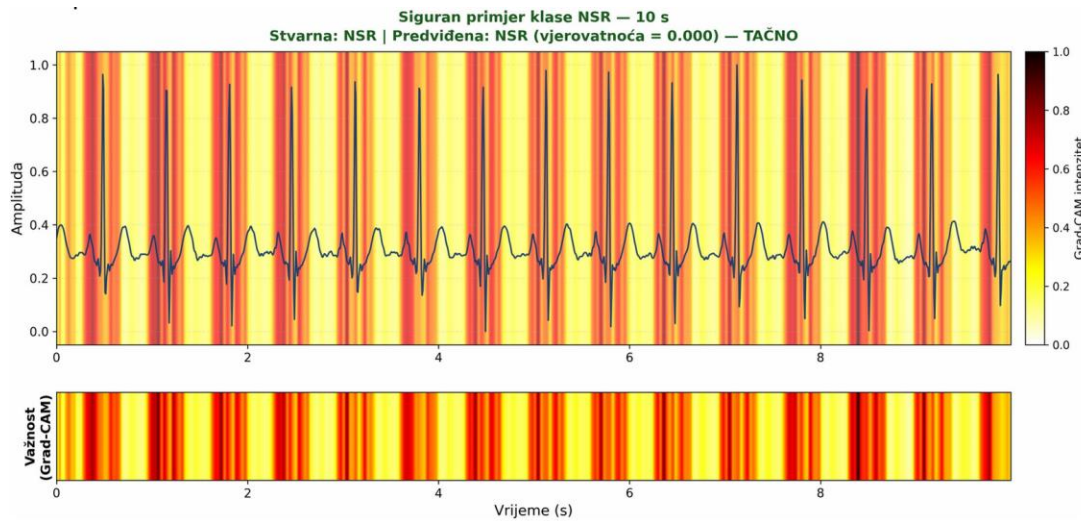
Exploratory Data Analysis - EDA

► Hierarchical EDA



Human Centered Approach

- ▶ Human in the loop
- ▶ Explainability for AI decisions – SHAP, GradCAM



Back to IEEE



Thank you for your attention!

