Project Proposal

Deep learning Methods for Heart Rate Estimation

Background:

Remote photoplethysmography (rPPG) methods have recently gained significant attention for their capability to extract heart rate from facial videos. However, the evaluation of these methods has primarily been conducted in controlled laboratory settings, leaving their effectiveness in real-world scenarios largely unexplored. To address this gap, Niu et al. [1] collected a substantial video dataset (VIPL) comprising 108 participants recorded across 9 distinct scenarios, simulating real-life conditions. This project aims to investigate how the performance of state-of-the-art methods is influenced by variations in scenarios and recording devices.

Tasks:

- Investigate the performance of state-of-the-art methods on the VIPL dataset.

Required skills:

- Basics of neural networks and machine learning.
- Proficiency in Python.
- Familiarity with PyTorch.

Incentives:

- Engage with state-of-the-art methods for rPPG estimation.
- Gain expertise in handling video datasets.
- Receive weekly supervision.

Supervisor(s):

- Bhargav Acharya, <bacharya@techfak.uni-bielefeld.de> (primary contact)
- Prof. Dr. Hanna Drimalla, <drimalla@techfak.uni-bielefeld.de>

References:

[1] Niu, X., Han, H., Shan, S., & Chen, X. (2019). VIPL-HR: A multi-modal database for pulse estimation from less-constrained face video. In *Computer Vision–ACCV 2018: 14th Asian Conference on Computer Vision, Perth, Australia, December 2–6, 2018, Revised Selected Papers, Part V 14* (pp. 562-576). Springer International Publishing.