Human Assisted Labeling for Digital Holographic Cell Images

The Chair of Data Processing (LDV) and the Chair of Biomedical Electronics (LBE) at the TUM Department of Electrical and Computer Engineering now offer an interdisciplinary project in the field of Human Assisted Labeling.

For every Supervised Machine Learning problem, a well labelled Ground Truth dataset is essential. In the CellFace project, cells must be segmented and classified in phase images. To create a Ground Truth manually is time-consuming and tedious.

In this project, a Human Assisted Labeling (HAL) solution will be developed to support researchers in segmenting cell images. Based on a small data set, the machine generates estimates for a potential segmentation or classification. Human beings only have to validate these. The improved result is then integrated into the training process in order to achieve fast convergence to a good performance.

Your tasks:
- Compose an overview of current labeling GUIs, services and technologies
- Adaptation of existing machine learning tools from the CellFace project for the HAL procedure
- Development of a Labeling GUI for the integration of the HAL process into a web environment CellPhaser
- Evaluation of usability (user experience) and label quality
- Optional: Integration of gamification elements

Your prerequisites:
- Good knowledge of Python
- Experience in Django, Tensorflow, JavaScript, Machine Learning, UI Design, Databases
- Optional: Dash (Plotly)
  Basic knowledge of UNIX/Linux

If you are interested, please refer to the following address by e-mail:

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