Deep Labeling of Motion Capturing Markers (Vali)

- Optical marker-based motion capture is the dominant way for obtaining high-fidelity human body animation
- Current approaches [1,2] only support automatic labeling for certain body parts, however, do not support whole body labeling and were not released under open source
- In this project, a technique using convolutional neural networks will be developed to solve the classification problem of whole body marker labeling in real-time and to enable interaction such as in VR with high-fidelity

[1] Shangchen Han, Beibei Liu, Robert Wang, Yuting Ye, Christopher D. Twigg, and Kenrick Kin. 2018. Online optical marker-based hand tracking with deep labels. ACM Trans. Graph. 37, 4, Article 166 (July 2018), DOI: https://doi.org/10.1145/3197517.3201399

[2] Gaojin Wen, Zhaoqi Wang, Shihong Xia, and Dengming Zhu. 2006. From motion capture data to character animation. In Proceedings of the ACM symposium on Virtual reality software and technology (VRST '06). ACM, New York, NY, USA, 165-168. DOI: http://dx.doi.org/10.1145/1180495.1180528

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- Step 1: Collect Data
  - Get training data of marker positions and skeleton poses in a user study with combined data from OptiTrack and HiSense Gloves
- Step 2: Develop Model
  - Build a classifier for body skeleton labeling using convolutional neural networks
- Step 3: Validate Model
  - Conduct a user study using multiple interactive tasks and multiple users to analyze the model's robustness using objective and subjective measures