**Problem Statement:**
In the industrial scenario humans and robots often share the same workspace posing a lot of threats to human safety issues. We focus on the:
- Intuitive and natural human-robot interaction.
- Safety considerations and measures in a shared work environment.
- The realization of cooperative process.
- The workflow optimization.

**Related Work:**
- This work builds on top of our previous work Sharma et al. [1,2,3] and Dittrich et al. [4] in order to improve segmentation performance.
- We use a random decision forest (RDF) for pixelwise object class labeling of human body-parts and industrial based components using depth measurements obtained from KINECT RGB-D ceiling sensor.

**Acknowledgements:**
- This work is supported by the BMBF funded project AMIKA and the EU project ROVINA.

**References:**


**Data Collection:**
- Human body-parts: head, body, upper-arm (Uarm), lower-arm (Larm), hand, and legs.
- Poses and shape: sitting, standing, walking, working, dancing, swinging, boxing, tilting, bending, bowing, and stretching with combinations of angled arms, single and both arms and other combinations.
- Human height range: 160-190 cm.

**Segmentation Results:**
- Segmentation results based on real-world test depth data.
- The graphs given below shows the effect of the number of training frames (F) and tree depth (D) on mean average recall (mAR) and precision (mAP) measures of pixelwise object class segmentation.
- Prediction results based on synthetic and real-world test data for a varying number of training frames. The first column shows the test depth data, and second, third, fourth columns show the corresponding prediction results respectively for F={40, 1600, 4800} with a probability threshold of 0.4. Class predictions with a probability less than the threshold are colored black in the result images.

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