time. As long, as ambiguous tracks are outnumbered by unique tracks, our approach is able to calibrate correctly. In $C4$ and $D3$, the tracks of both persons are mirrored (see Fig. 6(d)). Therefore, their shapes are different, even if the velocity profile, which is used for matching in [5], is similar. Since our approach applies a track assignment incorporating the shapes, false assignments are prevented and the obtained constraints are acceptable.

We additionally calculated the positional errors before the ICP step was applied to evaluate its influence on the quality of calibration. The comparison of our approach with ICP to our approach without ICP is shown in Table 3. It can be seen that ICP improves the calibration, if a good initial estimation was found (Setup A and B). If the estimation is only moderate (Setup C and D), ICP is not always able to improve the results.

Finally, our calibration algorithm shows perfect results in ordinary situations with a lot of scan overlap (Setup A and B). In challenging situations (Setup C and D), the limits of our approach are perceivable but calibration still succeeded. The advantages of shape-based track matching and full track alignment, as used in our calibration method, could be successfully demonstrated.

5. Conclusion

We have proposed a new method for calibrating multiple LRF units into a global coordinate system by observing person tracks, without any knowledge of the scene. Furthermore, we evaluated the performance on 13 different scenes and compared it to the state of the art algorithm, presented in Glas et al. [5]. Our experiments show, that our method outperforms [5] in easy settings as well as in difficult scenes. The results in ordinary scenes can be considered to be perfect. We also conclude, that post processing the results with ICP improves the alignment.

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