Drone Safety

The following Bachelor Thesis aims to provide a robust application to detect embodied communication features from video input in a workplace where men and autonomous robotic agents share their work environment. The application shall be computationally cheap and target low-cost camera modules which are attachable to drones. Since modern feature detection algorithms tend to be computationally expensive and therefore require powerful hardware an alternative approach is considered.

The calculation of a Symbolic Aggregate Approximation (SAX) string representing the embodied communication element, which is gained from the video input of a camera module shall provide such a computationally cheap algorithm. Based on the evaluation of requirements to the application, extracted from user stories, in combination with the provision of drone behaviour guidelines the application is developed iteratively. Furthermore, the Bachelor Thesis provides conclusions on robustness, the feasibility of real-time functionality as well as an outlook towards future work.
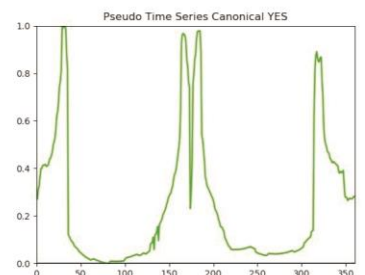
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Analyzed video frame. Each segment of the image is converted to a SAX letter. The red circles represent the SAX thresholds. The image is analyzed from the white line in counterclockwise direction.

Pseudo Time Series of the image with the person. The four limbs are clearly visible. The right arm on the left of the picture, the legs in the middle and the left arm on the right.