CDP // RECALIBRATED
Topic Summer 2024

Despite the constant increase in the use of a computer in architect offices, it is still widely unutilized in the early design stages. The biggest problem is not only the lack of appropriate Humane-Computer-Interfaces but also the limited possible use case scenarios. Furthermore, complex Software solutions and unfitting workflows restrict the creative process and hinder the design process. The goal of the „CDP // Recalibrated" is to bridge the gap between the established design tools utilized by architects and the digital tools.

The focus of the "Recalibrated"-topics is to explore new advancements in the field of tracking and computer vision that allow for a more fluid tracking and object recognition and reconstruction and also integrate more complex gestures, voices and commands. In this way, the architect can intuitively translate their natural interactions with the design space to a meaningful digital commands to operate the CDP.

Topics:

- **3D Real-time Reconstruction:** The CDP currently utilizes a depth camera that scans the area around a physical object and delivers a mean height value, which is then used to extrude the 2D Contour. This leads to loss of detail if the physical model has a more complex shape. The goal of this topic is to develop a realtime reconstruction algorithm that approximates such complex physical objects in real-time and still utilizes the mean height approach for simpler shapes (i.e. boxes)
- **Tracking:** This topic focuses on improving the already existing tracking algorithm to allow for a more fluent and intuitive tracking. Utilizing the 3D depth camera for extending the tracking is also an option.
- **3D Interactions:** The utilized depth camera offers not only adequate depth tracking, but also the possibility to track hands and voice recognition. This topic will focus on the exploration of possible hand gestures and voice commands that could be utilized during the collaborative design process.
- **Calibration:** The old calibration approach focuses on only one camera layout with many predefined values that hold true for two specific cameras. With the expansion of the research project the team is exploring creating more mobile or smaller versions of the original CDP and for them different constellations of hardware will be present. The goal of this topic is to refine the original calibration into a modern version that allows for various configuration and hardware

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