CASE STUDY: REPLICA LABS

Launching a camera-agnostic mobile 3D scanning system

PROJECT DESCRIPTION

Replica Labs created an application that created a 3D reconstruction of an object recorded on video via a mobile device such as an Android or iOS smartphone. This was one of the earliest successful examples of an adaptable monocular SLAM system.

CHALLENGES ADDRESSED

Replica Labs' technology relied on an early camera API offered on the Android platform. Important factors like camera focus and frame rate were difficult to control through this API, and crucial information was absent from streaming data.

PROPOSED SOLUTION

Calibration and test data were fused into one process. Instead of relying on the API, Replica Labs used the data itself to derive every metric needed to perform accurate monocular SLAM. This was done through a combination of data culling, computer vision, and a reliable server architecture.

TANGRAM APPROACH

- Derive important algorithmic information from imperfect sensor data
- Produce sensor data without tedious customization based on different hardware
- Unlock the full capabilities of Replica Lab's flagship 3D scanning application

RESULTS

Abstracting important information away from Android's API meant that any user could send in a video and receive an accurate 3D reconstruction, regardless of their camera model. This engineering solution ultimately proved better than the recommended Android API.