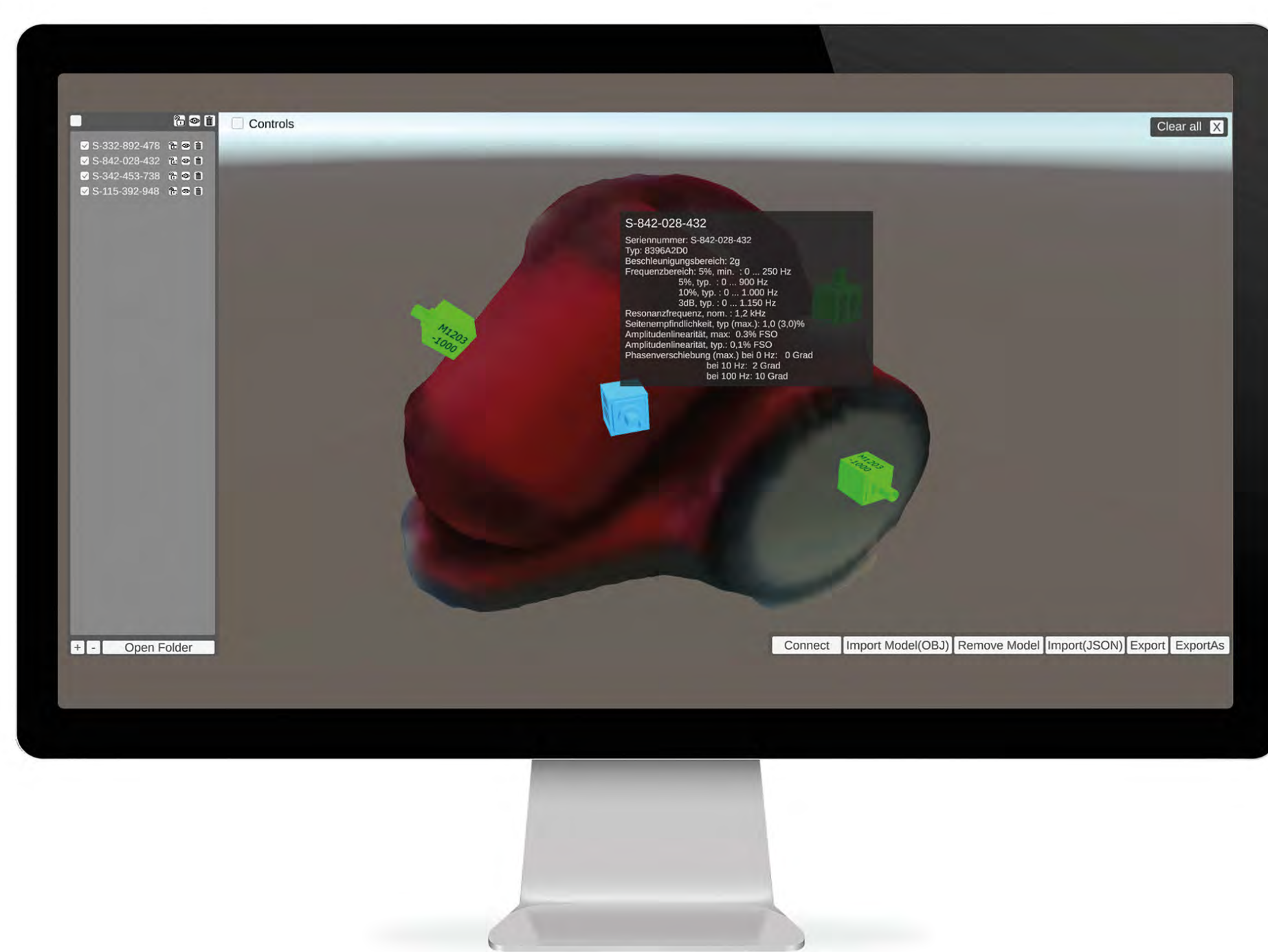# AR-based setup of vibration sensors in test rigs

Workflow for simplifying the setup process of vibration sensors in NVH testing environments using Microsoft's HoloLens 2

Introduction

The setup process of NVH testing is awkward and tedious as it requires measuring the positions of many vibration sensors by hand. As the sensors are all attached to the measurement system by cables, the test stand becomes crowded quickly, and it is easy to mix up sensors.

The AR-guided workflow described below simplifies the setup process by automatically calculating sensor positions and orientations and displaying tooltips to avoid mix-ups. Setup configurations can be designed anywhere and displayed as a guide on top of the real test aggregate.

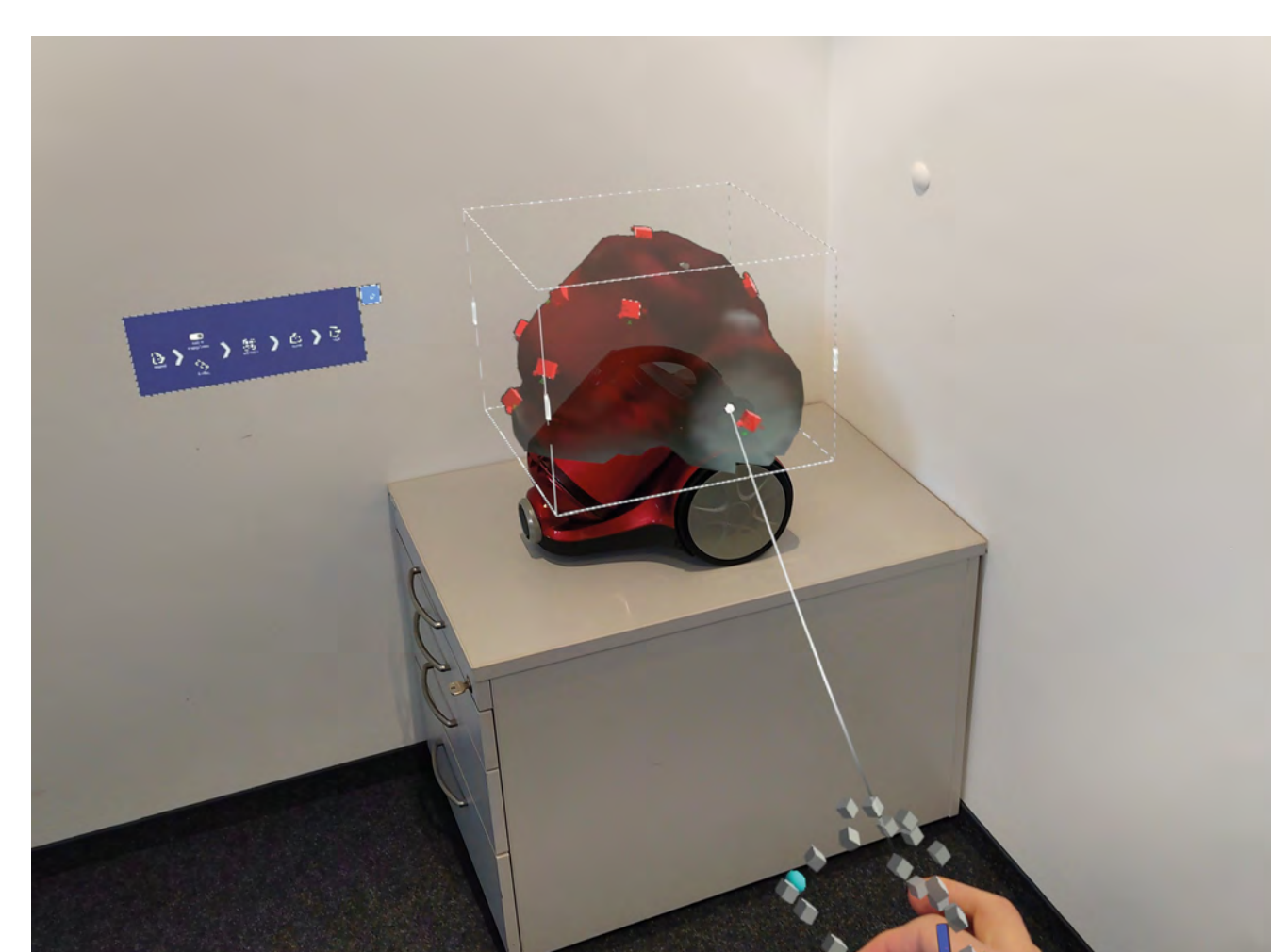### Setup planner (on any desktop or laptop)

1. Import of 3D mesh for the test aggregate and sensor files
2. Placement of virtual sensors onto virtual test aggregate
3. Export of configuration as a setup file

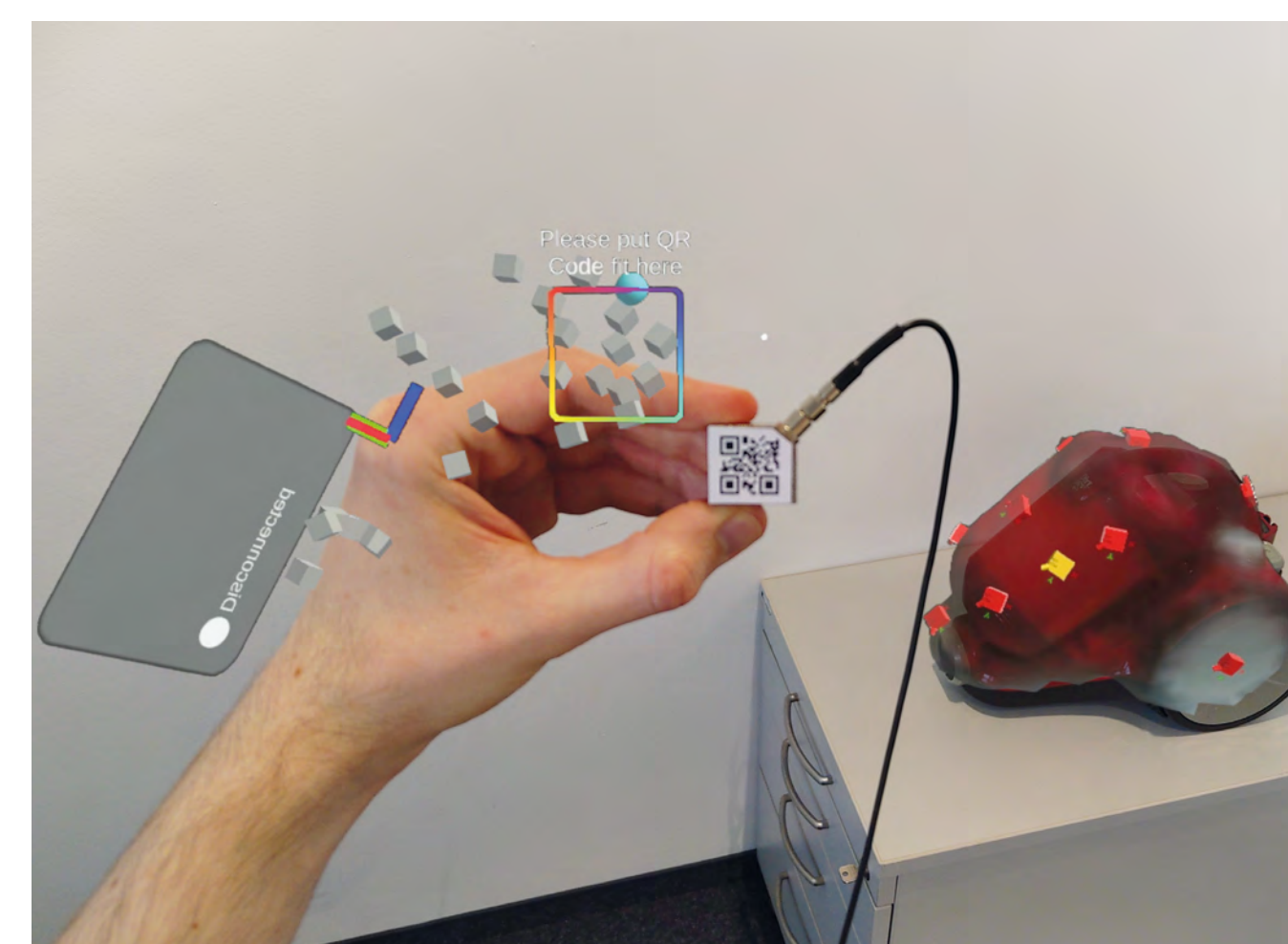### AR-based setup guide (on HoloLens 2)

1. Import of setup file
2. Alignment of virtual test aggregate with real test aggregate

a) Rough alignment by hand

b) Fine alignment with control menu

3. Scanning of the QR code on a real sensor and highlighting of the corresponding virtual sensor

4. Placement of the real sensor in the indicated position and orientation

5. Repetition of steps 3.– 4. for all sensors

BENEFITS

- Automatic determination of sensor positions and orientations
- Easy placement of real sensors
- Tooltips to prevent cabling mix-ups
- Less time consuming

LIMITATIONS

- Non-streamlined hand interactions with HoloLens 2
- Manual alignment of virtual and real test aggregate