

CSU44054/CS7GV4:

~~Augmented~~ Reality

Gareth W. Young

extended

Tracking

- Tracking Position and Orientation
- Tracking Attached Bodies
- 3D Scanning of Environments

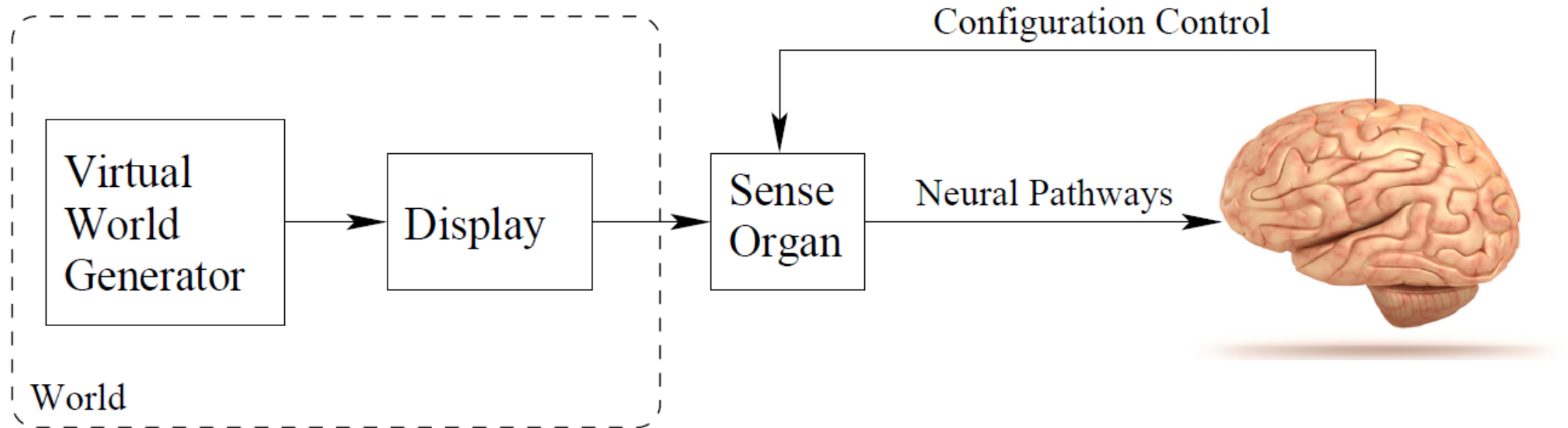
Tracking

The user's sense organs

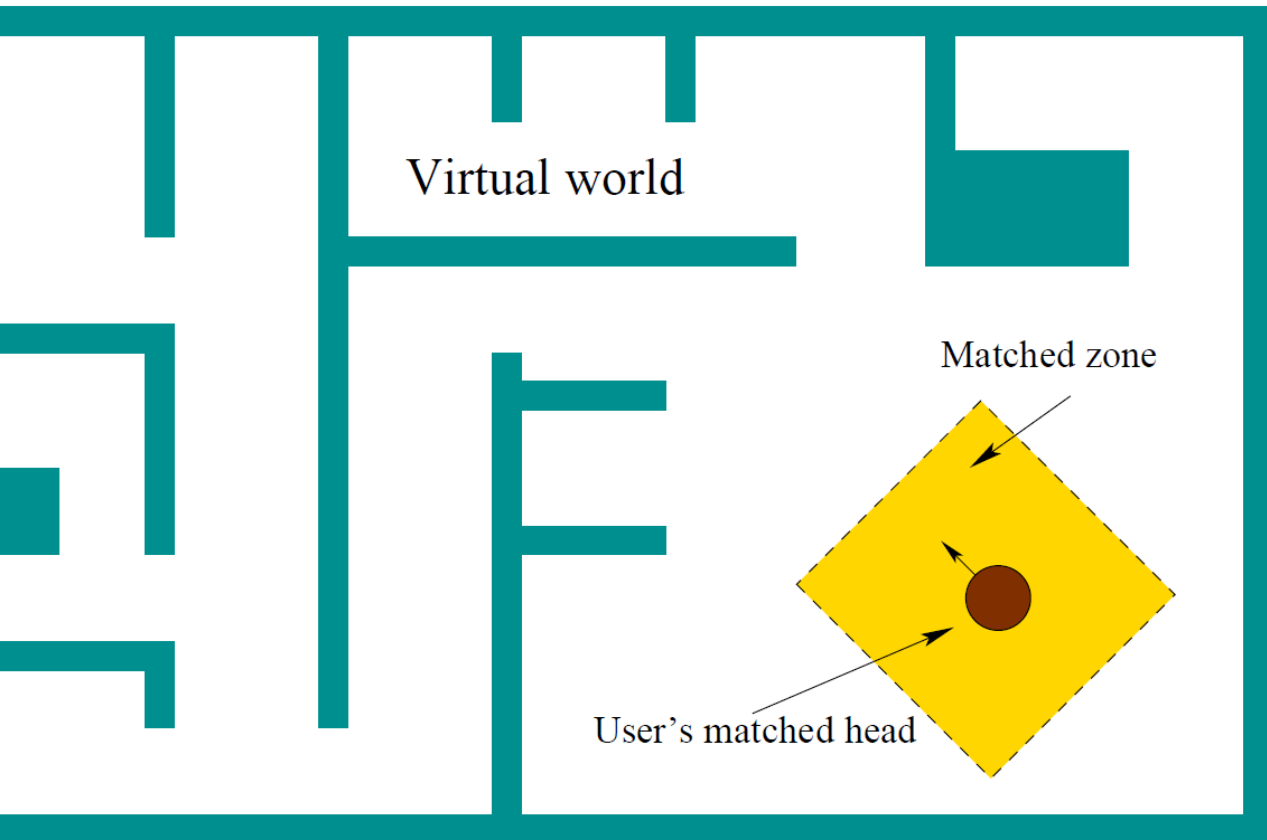
The user's other body parts

The rest of the environment

The user's sense organs



The user's other body parts

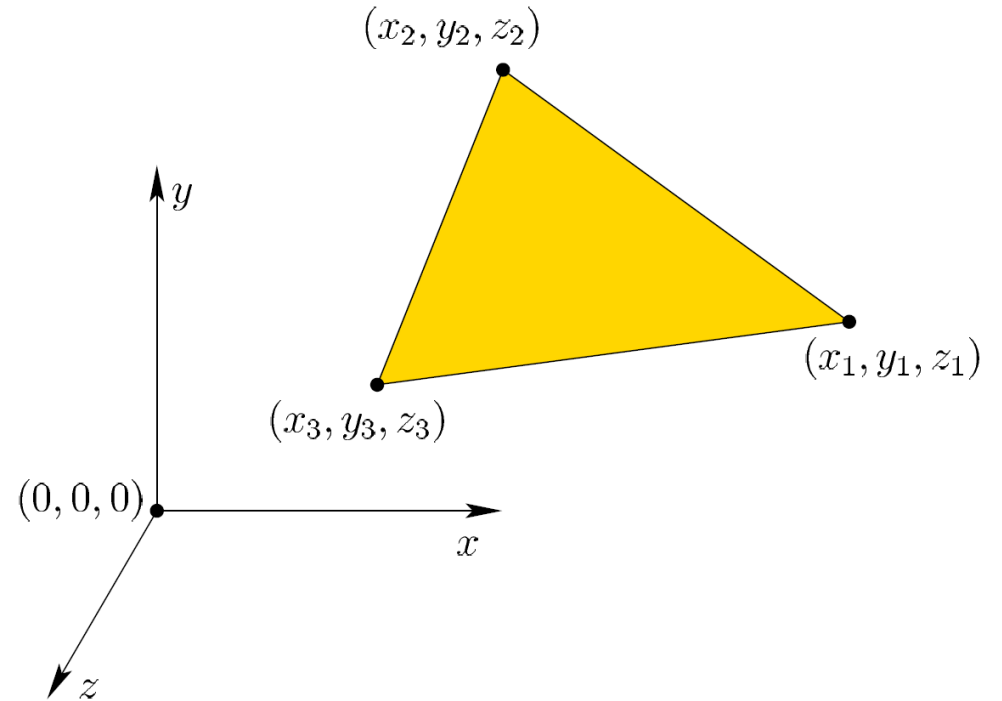
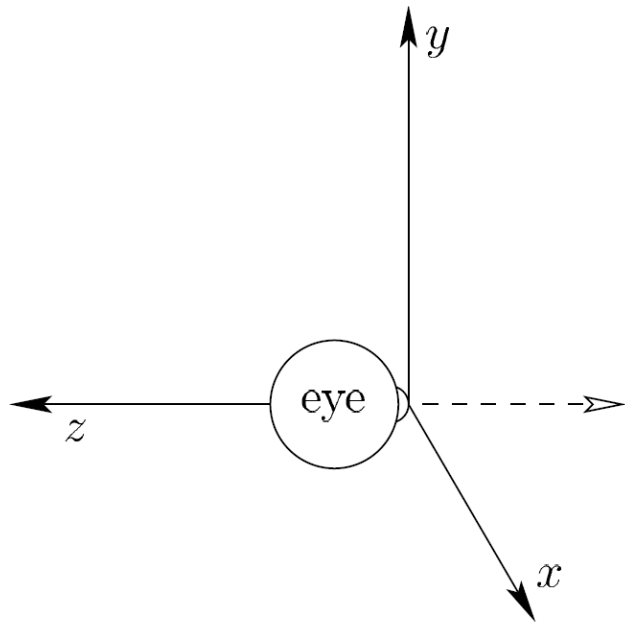




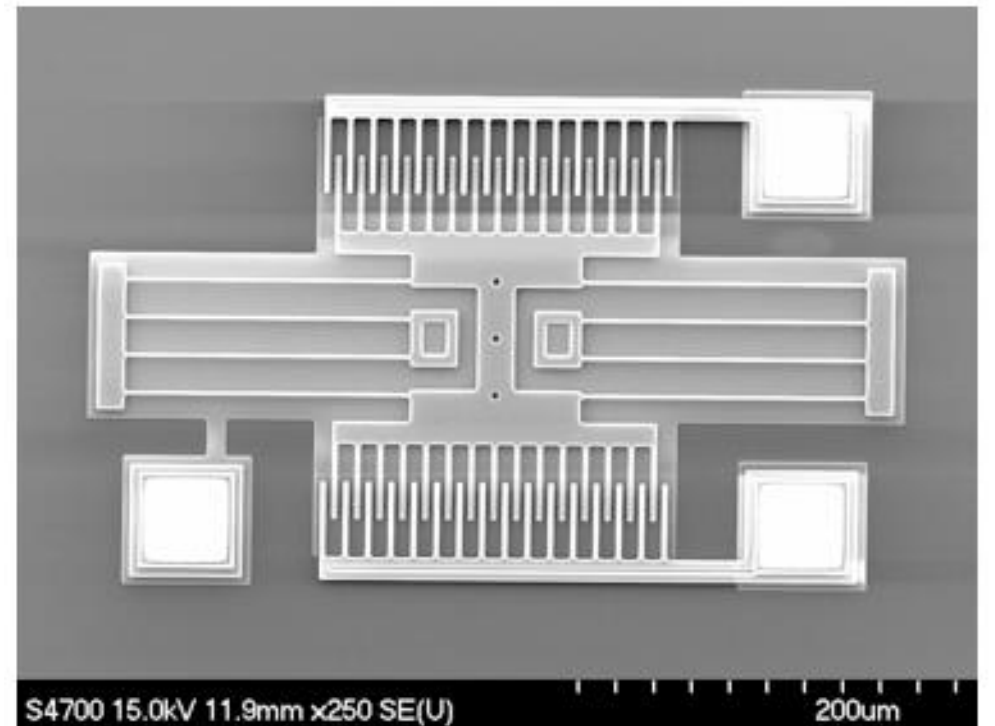
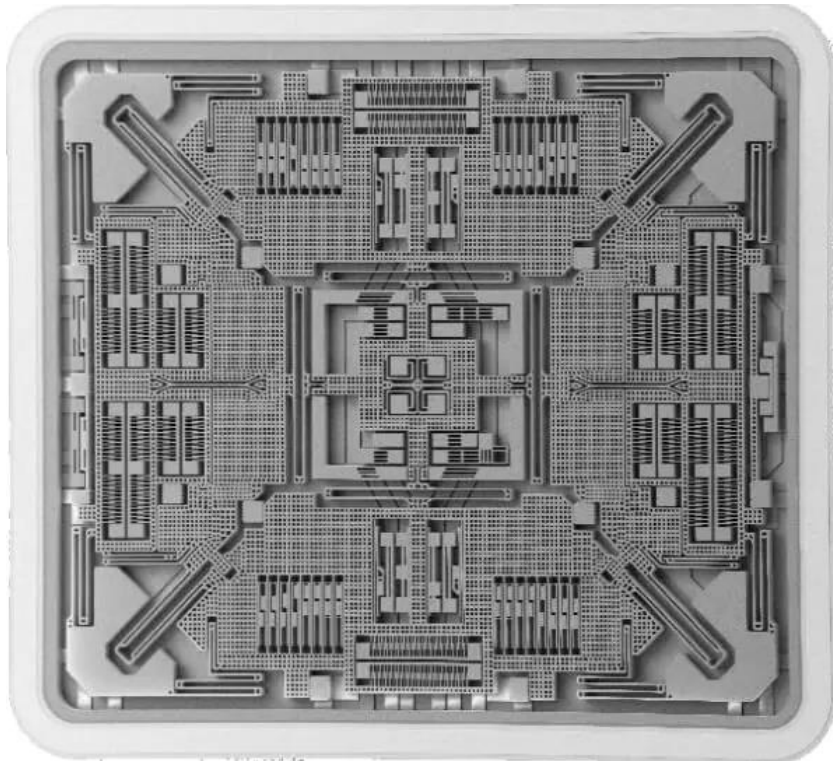
The rest of the environment



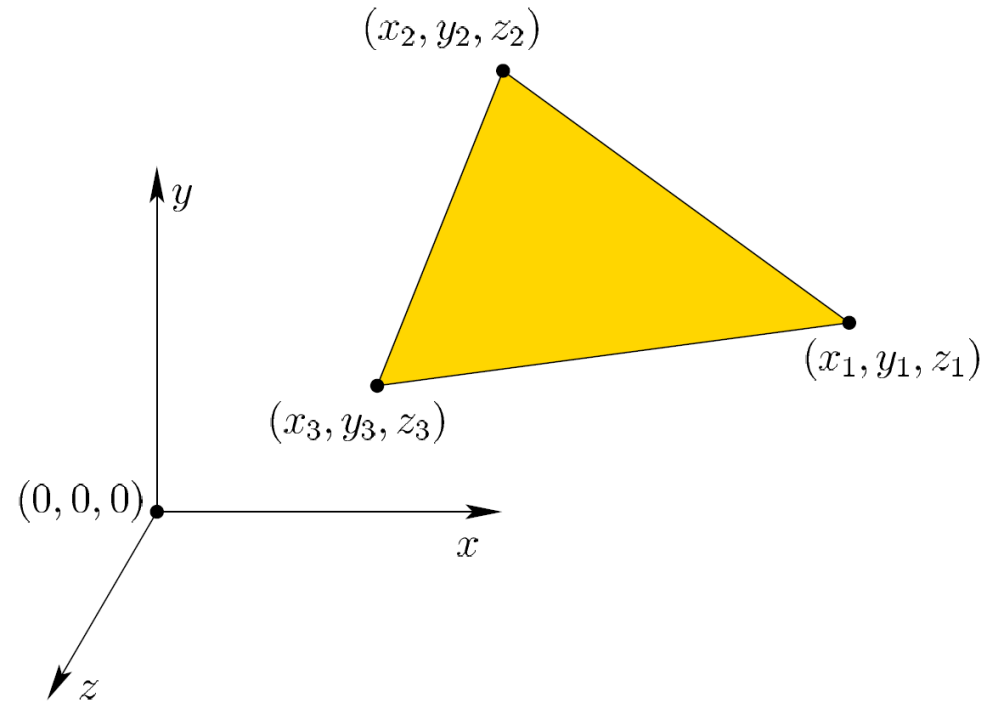
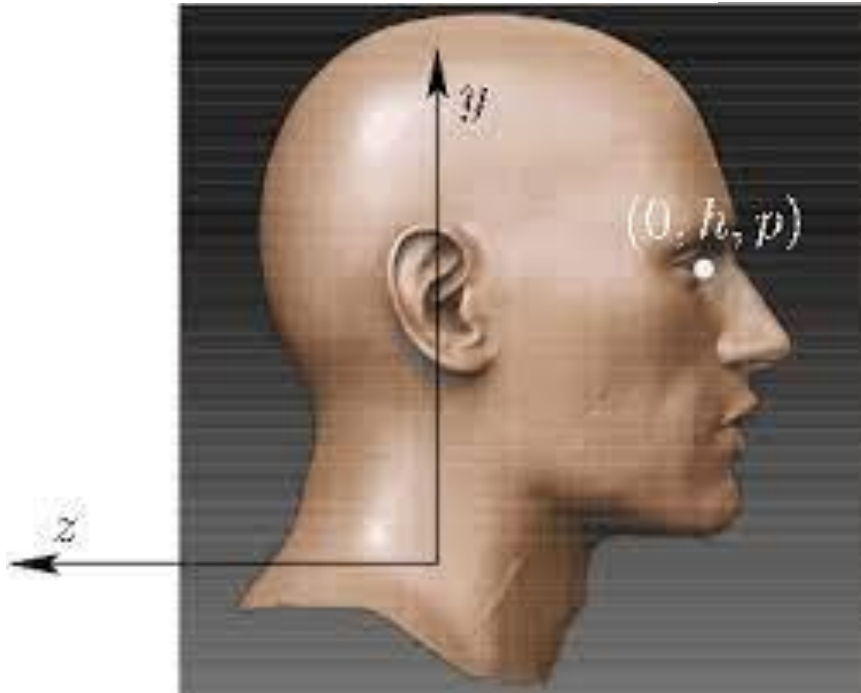
Tracking Position and Orientation



IMUs



Head Model Translation



Tracking Position and Orientation



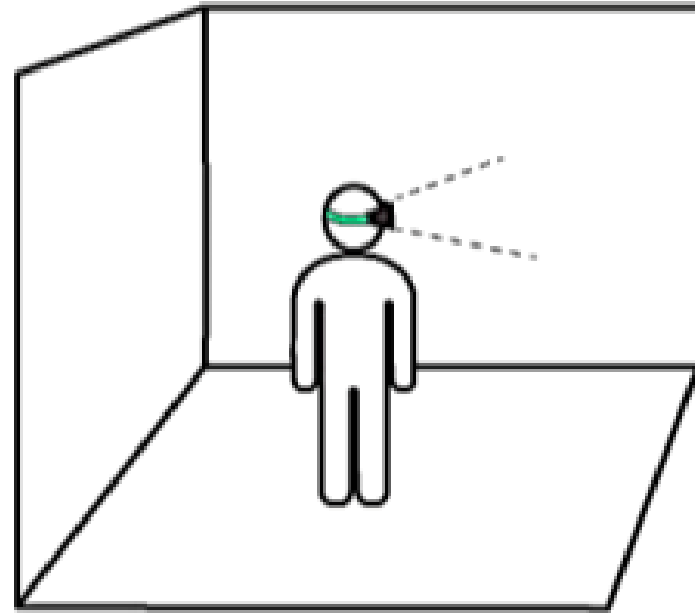
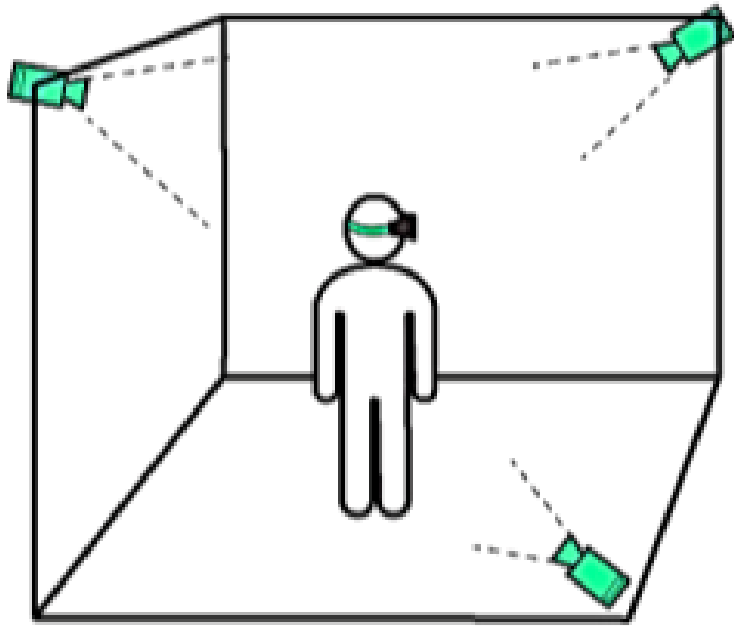
Tracking Position and Orientation



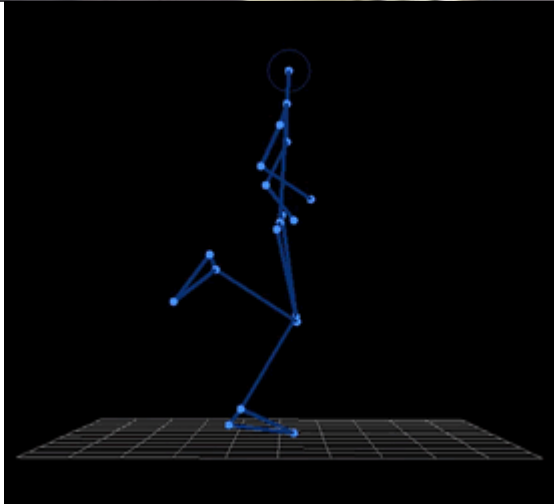
Tracking Position and Orientation



Outside in & Inside Out Tracking

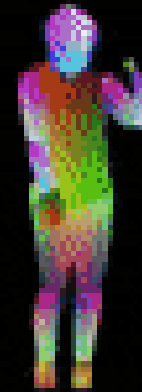
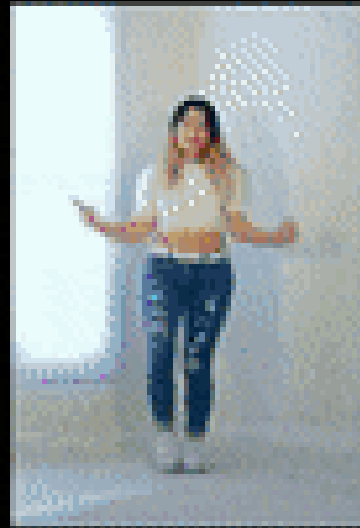
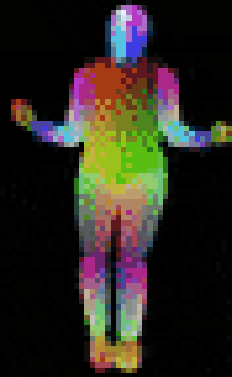


Motion capture systems



Motion
capture
systems

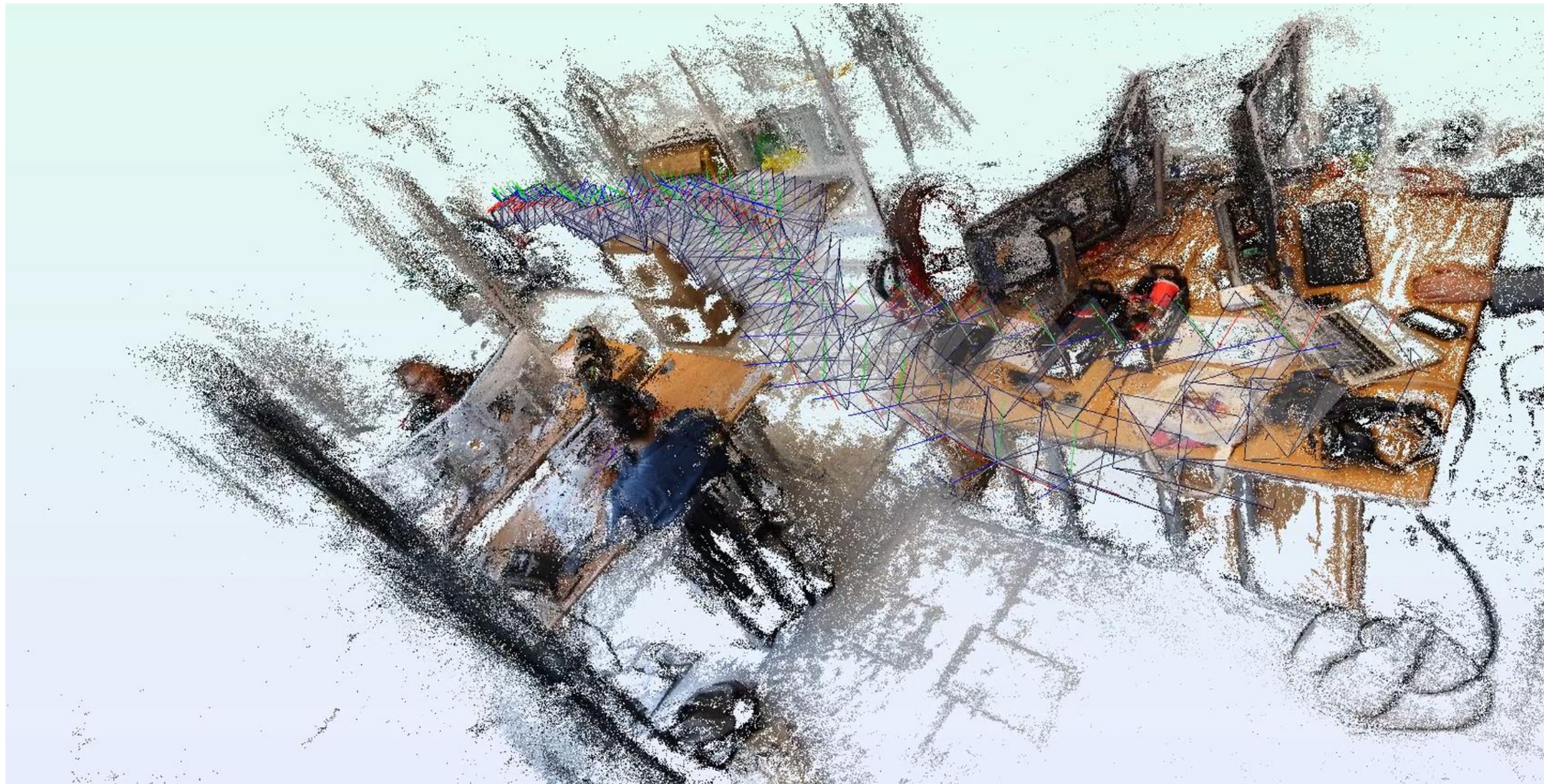
Pose-to-Body Results





3D Scanning of Environments





Camera Info

Viewpoint:	1.5279	-1.1096	2.4289
axis 0:	-0.8311	-0.1726	0.5287
axis 1:	0.0465	0.9257	0.3753
axis 2:	-0.5542	0.3365	-0.7613

FOV (Persp): 40.2047 Viewport (5123 x 2881)
Focal Length 3935.8501 PxSize (1.0000 x 1.0000)



FOV: 40.2047
FPS: 5.6
MIXED_RENDERING

Current Mesh model
Vertices: 21,682 (13,822,471)
Faces: 0 (0)
Selection: v: 0 f: 0
VC



Jonathan Swift

Virtual Reality

Jonathan Swift

Augmented Reality



Further Reading

- W. T. Fong, S. K. Ong, and A. Y. C. Nee. Methods for in-field user calibration of an inertial measurement unit without external equipment. *Measurement Science and Technology*, 19(8), 2008.
- G. Welch and E. Foxlin. Motion tracking: no silver bullet, but a respectable arsenal. *IEEE Computer Graphics and Applications*, 22(6):24–28, 2002.
- H. Zhou and H. Hu. Human motion tracking for rehabilitation - A survey. *Biomedical Signal Processing and Control*, 3(1):1–18, 2007.
- J. Fuentes-Pacheco, J. Ruiz-Ascencio, and J. M. Rendon-Mancha. Visual simultaneous localization and mapping: a survey. *Journal Artificial Intelligence Review*, 43(1):55–81, 2015.