NCT Project: Detector and Discriptor Outlier Rejection Evaluation for SLAM in MIS

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***Abstract*—**

I. Introduction

Performing Simultaneous Localization and Mapping (SLAM) inside the human body for Minimally Invasive Surgery (MIS) can be a difficult task due to the challenging environment.

One part of executing a feature-based SLAM is the detection and matching of such feature points. Finding those points usually works well in well lit and rigid environments, where the object of interest is not near the camera. As these conditions are not met under MIS conditions with deforming tissue and homogeneous surfaces, the tracking of features becomes harder. [1]

In this paper, we present different feature detection and outlier rejection methods that might improve the quality of the matching results.

II. Example Picture

Fig. 1

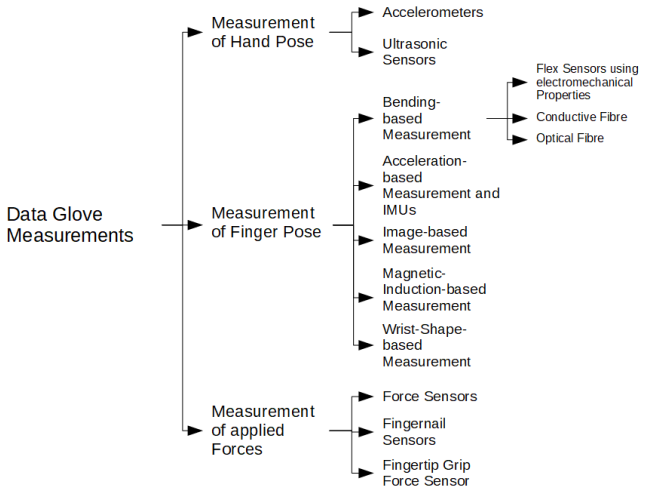

Fig. 1. Arrangement of measurement systems in a tree structure.

TABLE I
Example Table

Measurement System	**Advanteges**	**Disadvanteges**
Accelerometers	no line of sight needed	wrong orientation of sensors can cause false measurements
Ultrasonic Sensors	direct position measurement, no error propagation	requires line of sight and special measurement environment

III. Conclusion

References

[1] R. J. Chen, T. L. Bobrow, T. Athey, F. Mahmood, and N. J. Durr, "SLAM Endoscopy enhanced by adversarial depth prediction," *arXiv:1907.00283 [cs, eess]*, Jun. 2019, arXiv: 1907.00283. [Online]. Available: http://arxiv.org/abs/1907.00283 (visited on 11/16/2021).