3D Model Generation of Large Objects Using Autonomous Quadcopters

Edward Kelley
Advisor: Szymon Rusinkiewicz

1. Introduction

1.1. Background

For applications ranging from developing video games to preserving archeological artifacts, capturing 3D models of real-world objects has become a very important task. Many solutions exist for capturing

1.2. Motivation

1.3. Related Work

1.4. Hardware

2. Localization

2.1. Problem Definition

3. Project Status

3.1. Hardware Setup

3.2. Software

3.3. Next Steps

3.4. Timeline

References

[1] P.-J. Bristeau *et al.*, "The navigation and control technology inside the ar.drone micro uav," 2011.

[2] N. Dijkshoorn, "Simultaneous localization and mapping with the ar.drone," 2012.

[3] K. Leung, C. Clark, and J. Huissoon, "Localization in urban environments by matching ground level video images with an aerial image," in *Robotics and Automation, 2008. ICRA 2008. IEEE International Conference on*, may 2008, pp. 551 –556.

[4] M. Levoy *et al.*, "The digital michelangelo project: 3d scanning of large statues," in *Proceedings of the 27th annual conference on Computer graphics and interactive techniques*, ser. SIGGRAPH '00. New York, NY, USA: ACM Press/Addison-Wesley Publishing Co., 2000, pp. 131–144. Available: http://dx.doi.org/10.1145/344779.344849

[5] S. Rusinkiewicz, O. Hall-Holt, and M. Levoy, "Real-time 3d model acquisition," 2002.

[6] R. Steffen and W. Förstner, "On visual real time mapping for unmanned aerial vehicles," in *21st Congress of the International Society for Photogrammetry and Remote Sensing (ISPRS)*, 2008, pp. 57–62.

[7] T. Yap *et al.*, "A particle filter for monocular vision-aided odometry."