Semi-Direct Visual Odometry and Mapping with RGB-D Camera

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***Abstract*— We propose a …**

# I. INTRODUCTION

The problem of simultaneous localization and mapping(SLAM) is one of the hotspots in the field of robotics over the past decade. Precise positioning is the basis for robot control and navigation in GPS-denied environments. Especially for micro aerial vehicle(MAV) working in complex and cluttered unknown indoor environments. They need to constantly update their position at high rates and low latency for position and orientation control. At the same time, they can only carry limited weight and power consumption of the sensor and processor. While previously many SLAM systems relied on expensive and heavy laser scanners. RGB-D cameras based on structured light provide a powerful alternative and well suited for such application. For instance, the Asus Xtion sensor provides both color and depth images directly in real-time. As the sensor weighs only 77 grams and consumes less than 2.5 watt, it can be easily used for localization, mapping and navigation of MAVs.

To our knowledge,