Project name: "Augmented Treasure Hunting"

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Supervised by:

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Target:

Using existing mapping system along with an indoor drone, we built a game of treasure hunt. The treasure is a virtual object planted in the previously created 3D point cloud of the scene. In real-time, the user can see the live feed from the drone, along with the virtual objects that are hidden in some parts of the map and rendered into the camera stream.

OS: Ubuntu 16.04

We have tested the project in Ubuntu 16.04, but it should be easy to compile in other Linux platforms.

Drone: dji Tello mini drone

Also, we used Sony Play Station web cam for testing

APIs:

- Pangolin – we used Pangolin for visualization and user interface
- OpenCV – we used OpenCV to manipulate images and features
- DBoW2 – we used modified versions of the DBoW2 library to perform place recognition
- g2o – we used g2o library to perform non-linear optimizations
- Eigen3 – is required by g2o
- ROS – we used ROS for creating and managing topics and interaction between them
- TelloDriver – communication with the Tello drone library
- Using TelloDriver lib, ROS and Keyboard lib we created our module for controlling drone from a keyboard
- ORB SLAM – real-time SLAM library for Monocular, Stereo and RGB-D cameras that computes the camera trajectory and a sparse 3D reconstruction

Languages: Python, C++

Architecture:

Find The Treasure

Topic: Image_raw

Publish Image

Image Input

subscribe

Send Control Command

Tello Driver

Tello Driver

subscribe

subscribe

subscribe

Topic: takeoff

Topic: land

Topic: cmd_vel

publish

publish

publish

Drone Controller

Drone Controller

Orb Slam

Find The Treasure

Image Processing

Orb Slam 2 Ros

Point Cloud

| insert | clear |
| save | load |

Image Output To Pangolin

Pangolin