Project name: “Augmented Treasure Hunting”

Students: Michael Cudryavtsev and Ilya Freydkin

Supervised by:
Roman Rabinovich, Ibrahim Jubran and Yaron Honen

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

Drone Controller

Tello Driver

Send Control Command

Topic: takeoff

Topic: land

Topic: cmd_vel

Image Input

Publish Image

subscribe

Orb Slam

Orb Slam 2 Ros

Find The Treasure

Image Processing

Pangolin

Image Output To Pangolin

Drone Controller