Ground Truth Recorder Service – Readme

Recorder Service is a tool for parallel recording of a RealSense camera and a ground-truth external source. The purpose of the tool is to enable simultaneous recording from 2 different sources so the obtained data could be used for validation needs, e.g compare the data given from the realsense camera to the data given from the GT source. In practice, the service receives calls from the client recorder (realsense camera recorder) and trigger the GT source to act appropriately.

The tool is implemented in a service mode and thus supports recording from 2 different operating system. The server itself is a windows tool. The service name is: “GTService”. Link from local host: https://127.0.0.1:8080/GTService.

Note: the service must run before connecting to it.

Code location in TFS: $/SW/CVL/Tools/GTool/RecordService

Requirements:

- C++ compiler: Visual Studio 2013 (v120) (needed only for compiling GTUtils projects, if wanted) or Visual Studio 2015 (v140).

Dependencies:

- From TFS -> CVL -> Tools -> 3rdparty get latest of:
    - GTUtils
    - For using optitrack: Optitrack
    - For using optotrack: Ndloapi
      Need in addition an installation of NDloapi:
        - Install OAPI from: \\PerC_storage.jer.intel.com\PerC_Content\PerC\CVL\Scene_Perception\Useful\OAPI
        - Set C:\ndigital\drivers as system variable.
        - Install win 8 drivers from: \\PerC_storage.jer.intel.com\PerC_Content\PerC\CVL\Scene_Perception\Useful\NDI_SerialDrivers_Windows8\NDI_SerialDrivers_Windows8

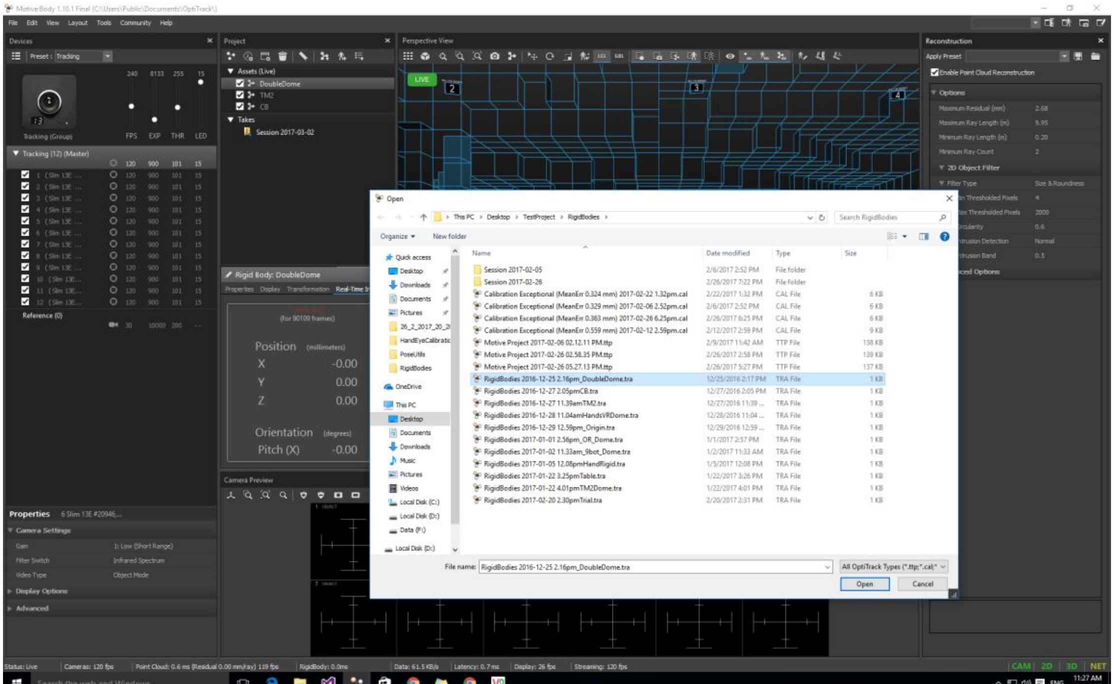
- ➢ For using Kinect: *not supported yet*
- ➢ For using Thermal camera: *not supported yet*

How to run:

- Run RecorderService.sln as administrator
- Set RecorderHost project as a startup project
- Add the wanted GT source number to program arguments, according to the following options:
  - ➢ 0: Optitrack
  - ➢ 1: Optotrak
  - ➢ 2: Kinect (not implemented yet)
  - ➢ 3: Thermal camera (not implemented yet)
  - ➢ Default is: Optitrack
- Start running the client recorder
- Let the process run…
- Stop GT recording by exit the client recorder as its expected closing way.
- Exit recorder service

Important note: in case of using Optitrack as GT, the next preliminary step should be performed ***before*** the steps listed above:

- ❖ Open Motive application
- ❖ Make sure your wanted rigid-bodies for tracking appear in the assets list under the “project” pane. (Could be viewed through “view” tab -> “Project”). If not, import the rigid-body by clicking file->open, navigate to where it is stored and choose the rigid-body file by its name.



Name	Date modified	Type	Size
Session 2017-02-05	2/6/2017 2:52 PM	File folder	
Session 2017-02-26	2/26/2017 7:22 PM	File folder	
Calibration Exceptional (MeanErr 0.324 mm) 2017-02-22 1.32pm.cal	2/22/2017 1:32 PM	CAL File	6 KB
Calibration Exceptional (MeanErr 0.329 mm) 2017-02-06 2.52pm.cal	2/6/2017 2:52 PM	CAL File	6 KB
Calibration Exceptional (MeanErr 0.363 mm) 2017-02-26 6.25pm.cal	2/26/2017 6:25 PM	CAL File	6 KB
Calibration Exceptional (MeanErr 0.559 mm) 2017-02-12 2.59pm.cal	2/12/2017 2:59 PM	CAL File	9 KB
Motive Project 2017-02-06 02.12.11 PM.ttp	2/9/2017 11:42 AM	TTP File	138 KB
Motive Project 2017-02-26 02.58.35 PM.ttp	2/26/2017 2:58 PM	TTP File	139 KB
Motive Project 2017-02-26 05.27.13 PM.ttp	2/26/2017 5:27 PM	TTP File	137 KB
RigidBodies 2016-12-25 2.16pm_DoubleDome.tra	12/25/2016 2:17 PM	TRA File	1 KB
RigidBodies 2016-12-27 2.05pmCB.tra	12/27/2016 2:05 PM	TRA File	1 KB
RigidBodies 2016-12-27 11.39amTM2.tra	12/27/2016 11:39 ...	TRA File	1 KB
RigidBodies 2016-12-28 11.04amHandsVRDome.tra	12/28/2016 11:04 ...	TRA File	1 KB
RigidBodies 2016-12-29 12.59pm_Origin.tra	12/29/2016 12:59 ...	TRA File	1 KB
RigidBodies 2017-01-01 2.56pm_OR_Dome.tra	1/1/2017 2:57 PM	TRA File	1 KB
RigidBodies 2017-01-02 11.33am_9bot_Dome.tra	1/2/2017 11:33 AM	TRA File	1 KB
RigidBodies 2017-01-05 12.08pmHandRigid.tra	1/5/2017 12:08 PM	TRA File	1 KB
RigidBodies 2017-01-22 3.25pmTable.tra	1/22/2017 3:26 PM	TRA File	1 KB
RigidBodies 2017-01-22 4.01pmTM2Dome.tra	1/22/2017 4:01 PM	TRA File	1 KB
RigidBodies 2017-02-20 2.30pmTrial.tra	2/20/2017 2:31 PM	TRA File	1 KB

File name: RigidBodies 2016-12-25 2.16pm_DoubleDome.tra

All OptiTrack Types (*.ttp;*.cal;*

- ❖ Check your wanted rigid-body by marking “v” in the small square on the left of the rigid-body name. Recommended: uncheck other rigid bodies, i.e. the rigid bodies you are not interested of their tracking information.

Output

The program provides a folder with the following components:

- Recorded GT stream data. The saved data depends on the chosen GT source.
    - In case of using *Optitrack* system as GT:
        - A text file for every tracked rigid-body, for example: “DoubleDome_RigidBody.txt”. every line in this file is a pose of this RB by the following specification: RB id, timestamp, frame number, tracking status, rotation[0], rotation[1], rotation[2], translation-x, rotation[3], rotation[4], rotation[5], translation-y, rotation[6], rotation[7], rotation[8], translation-z, error.
- RSSDK file from the client recorder
- An ini format file, contains the Realsense camera properties, such as: firmware version, intrinsics and extrinsics, IMU params, GHC matrix in case of using OT as GT source etc…

  The folder will located in: "..\\..\\..\\..\\output\\OptitrackResults\\PosesFiles\\" in relation to the executable file location.

The folder name is composed of date and time + the string “_record”, for example: “22_2_2017_15_58_48_record”

Functions

The service implements a list of functions, which might be called from the client, in the following order:

- ✓ bool **GTInitEx**(string param1, string param2, string param3, string param4, string param5) – initialize GT source. Parameters are dependent on GT source type.
    - In case of using *Optitrack* system as GT:

    - param1 – the name of the rigid-body which is connected to the camera. default is: “DoubleDome”
    - param2 – need to be “1”. (indicates that the OT system is running in “record” mode)
    - Param3 – middle-ware name. Default is: “sp”.
    - Param4 – optitrack client ip. Default is: “10.12.144.144”
    - Param5 – optitrack server ip. Default is: “10.12.144.144”

- public string **GetGHCString**() – for OT system only - This function returns the latest GHC matrix of the given rigid-body (according to first parameter in previous function) from the server and writes it to the ini file under the title “Transformation”.
- public void **GTStart**() - triggers the GT source to start record.
- void **GTStop**() - triggers the GT source to stop record.
- public List<OTPoseStruct> **GetOTPosesBuffer**() - for OT system only - this function returns a list of all OT poses which have been received during the record. The poses are in the known format of: object id, timestamp, frame number, tracking status, rotation[0], rotation[1], rotation[2], translation-x, rotation[3], rotation[4], rotation[5], translation-y, rotation[6], rotation[7], rotation[8], translation-z, ot error.
- bool **GTShutdown**() – shut down GT source.

optional functions:

- public bool **OTIsInRange**() – returns whether the rigid-body which is connected to the camera is tracked at this moment or not.