VRPN OpenHaptics Server developed by University of Malaga (UMA)

The modifications to the VRPN v0733 standard distribution are listed below.

- We have added a new sever to the vrpn_Generic_server_object.h and .c

```
int setup_OpenHaptics(char *&pch, char *line, FILE *
/*config_file*/);           //# 2015.03.18 UMA modification
```

- We have included the following files:
    o Vrpn_OpenHaptics.h
    o Vrpn_OpenHaptics.C
    o openGLWindow.h
    o openGLWindow.C

Our server needs an openGL window to work and make the haptic rendering, so we have added the definition of that window in a specific file (openGLWindow). Unfortunately, we think that this openGLWindow only runs in a Windows OS machines at the moment. Additional work would be necessary to extend it to Unix/Linux systems. We are not experts in these OS, hence, someone of the VRPN community might help us with that.

- We have modified the following files in order to add the interfaces for the new OpenHaptics server.
    o Vrpn_ForceDevice.h
    o Vrpn_ForceDevice.C
    o Vrpn_ForceDevice_Server.h
    o Vrpn_ForceDevice_Server.C

We also use the original methods: *setVertex* and *setObjectisTouchable*. And we modified the code in the methods: *handle_setVertex_messages* and *handle_setObjectisTouchable* inside the "ifdef VRPN_USE_HDAPI" as you can see in the following block of code.

```
#ifdef VRPN USE HDAPI
    //UMA*********************************************************
    if (me->setVertex(objNum, vertNum, x, y, z)) {
        return 0;
    }
    else {
        fprintf(stderr, "vrpn_Phantom: error in trimesh::setVertex\n");
        return -1;
    }
    //***********************************************************
```

- We had to comment line 1734 of the *vrpn_Phantom.C* file because we have an error in this line when we compile the distribution in a Windows PC. The error is shown below.

```
error C3861: 'ntohd': identifier not found
…\server_src\vrpn_Phantom.C 1734 1 vrpn_phantom
```

Authors: Maria Cuevas-Rodriguez, Daniel Gonzalez-Toledo, Luis Molina-Tanco, Arcadio Reyes-Lecuona- University of Malaga – {mariacuevas, dgonzalezt, lmtanco, areyes}@uma.es

- Finally, we have added our sever to the *vrpn.cfg* file

```
################################################################

# Geomagic Technologies Geomagic Touch (formely Sensable Phantom force-feedback

# device opened using the HDAPI and HLAPI software developer's kit.

# For Geomagic Touch Desktop systems, you don't need to have the user establish the

# reset position. For the Premium models, you do.

# Arguments:

#         char        name_of_this_device[]

#         int         establish_reset_position        (0 or 1)

#         float       rate to send tracker and events reports in the worst-case scenario

#         float HL_EVENT_MOTION_LINEAR_TOLERANCE = Double precision value representing the minimum rotation, in
radians, that the proxy must move before a motion event is triggered.

#         float HL_EVENT_MOTION_ANGULAR_TOLERANCE = Double precision value representing the minimum distance, in
device workspace coordinates, that the proxy must move before a motion event is triggered.

#         char        Name of the Phantom in the configuration control panel

#vrpn_OpenHaptics  Phantom  0        60.0      1.0                0.02        Default PHANToM

################################################################
```

- To add our sever to the Git version control system, we have modified the .gitignore file to indicate the Git system to ignore the *built* folder. See figure below.

```
#Folder with build project

build/
```

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{mariacuevas, dgonzalezt, lmtanco, areyes}@uma.es