

Game Engine

The MotionNode Inertial Measurement Unit (IMU) includes software for easy integration with real-time 3D game engines. This document describes and implements real-time animation of a 3D object with the MotionNode IMU. For this example, we will use the Panda3D game engine framework by Carnegie Mellon University and Disney (www.panda3d.org). This example uses the MotionNode IMU as an input device rather than as an animation recording tool.

Panda3D Framework

Panda3D is freely available from the project web site referenced above. The framework includes interfaces in the Python and C++ programming languages. We will use the Python interface for our example. Download and install the framework to continue.

Once the Panda3D SDK framework is installed, open the *run_panda3d.py* file from the application note files in a text editor. This is a Python script file that sets up the MotionNode device and creates game engine scene. In this case, the MotionNode orientation is applied to a model. The rotation of the mesh changes with real-time updates from the MotionNode IMU.

Tracker Setup

In this example, Panda3D accesses the MotionNode data stream using a built in Virtual Reality Peripheral Network (VRPN) plugin. The VRPN is a transparent interface between tracker hardware and VR systems. VRPN is an open source project and available from UNC-Chapel Hill (www.cs.unc.edu/Research/vrpn/). The application note files include a VRPN server application

configured for use with a MotionNode IMU.

To run the Panda3D scene with real-time orientation updates the VRPN server must first be running. Simply launch the on the *vrpn_server.exe* application to start the tracker data interface. Of course, the MotionNode IMU must also be plugged in at this time.

Real-time Animation

Once the orientation tracker stream is available run the Panda3D application. There is a shortcut file that runs the Panda3D bundled Python interpreter with the *run_panda3d.py* script file as its argument. For more information on how to run general Panda3D applications refer to their tutorial online.

The Python script file loads a model of an olive with wings. The current rotation of the MotionNode IMU is applied to the object in real-time. Use the three mouse buttons to control camera pan, zoom, and rotate. This is a basic example but easily extended to more advanced scenes. Multiple MotionNode IMUs may be used to control any number of objects in the scene.

Checklist

1. Install Panda3D SDK toolkit.
2. Start MotionNode IMU
3. Launch VRPN server from application note files
4. Run the Panda3D bundled Python interpreter with *run_panda3d.py* as its input

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