Quaternion PID-Controller

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PID Controllers

This package includes a PID Controller implementation which operates on Quaternions. This allows easy PID control of an object's rotation. If you do not know how to use a PID Controller or how it works please check https://en.wikipedia.org/wiki/PID_controller.

Package Folder Structure

The package files are organized as follows:

QuaternionPidController/Scripts/	The main script files including the controller class itself.
QuaternionPidController/readme.pdf	This file.
Sample/Script	A sample scene and a few scripts showing how to use the controller.
Standard Assets/	Standard assets used for the sample scene.

Set up instructions

After importing the package, *QuaternionPidController* is ready to be used. Just select the sample scene under *QuaternionPidController/Sample* and hit the play button. Check the *ControlledObject.cs* file for an example on how to use the controller in code.

The class has one main method called *ComputeRequiredAngularAcceleration()* which takes four parameters:

- *currentOrientation*: The current orientation of the object.
- *desiredOrientation*: The desired orientation the object should achieve.
- *currentAngularVelocity*: The current angular velocity of the object's rigidbody.
- *deltaTime*: The frame delta time.

The call returns a Vector3 which can be used as a rotational acceleration vector on the rigidbody. See *ControlledObject.cs* on how to use it.

The class constructor takes the regular three gain values for a PID controller for proportional, integral and derivative gain. If you need information about how to tune these values for a PID controller, check https://en.wikipedia.org/wiki/PID_controller. As a general guideline:

Effects of *increasing* a parameter independently

Parameter	Rise time	Overshoot	Settling time	Steady-state error	Stability
K_p	Decrease	Increase	Small change	Decrease	Degrade
K_i	Decrease	Increase	Increase	Eliminate	Degrade
K_d	Minor change	Decrease	Decrease	No effect in theory	Improve if K_d small

Online support

If you have any questions or suffer any inconvenient, please contact me at info@vacuumbreather.de.