



## 3D Printed Hoverboard GoPro Mount

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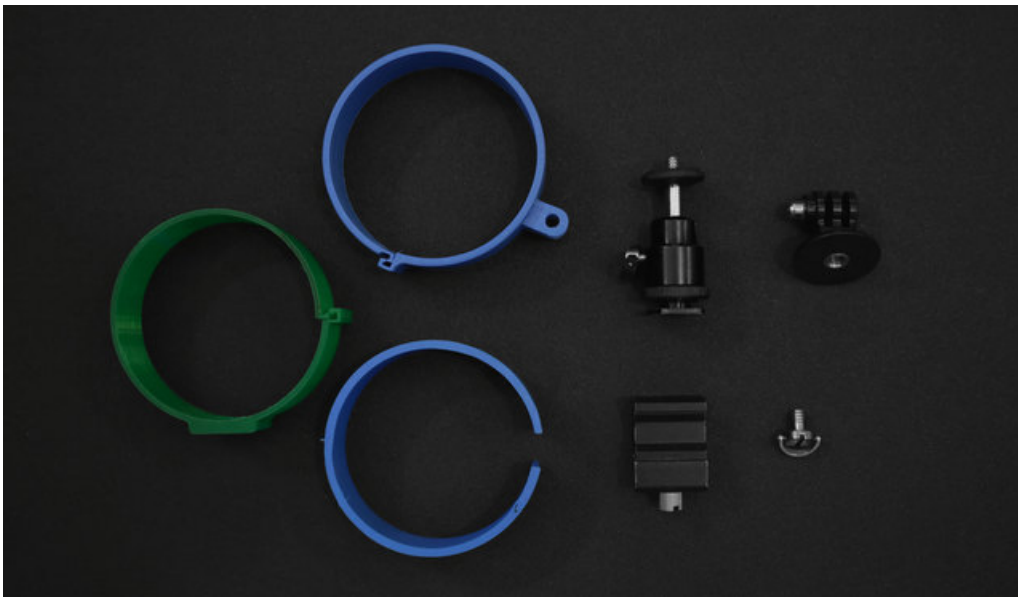
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## Overview

Self balancing scooters (hoverboards) can make an image stabilizer camera rig that can be used to capture smooth, low angle shoots.

Mounting a small camera to the body of the scooter can be challenging because the center part of the board twists while in operation.

With a 3D printed adapter, we can add a clamp for a camera mount to the middle of the board without obstructing riding or interfering with the position of the camera mount.



## Parts List

Below is a list of parts used in this project.

- [Camera shoe mount \(http://adafru.it/2410\)](http://adafru.it/2410)
- [D-Ring \(http://adafru.it/2629\)](http://adafru.it/2629)
- [Swivel-Head Pan Tilt \(PTZ\) Shoe Mount Adapter \(http://adafru.it/2464\)](http://adafru.it/2464)

- GoPro Camera Tripod Mount

## Tools & Supplies

Here's a list of tools used to get this project completed. If you don't have access to a 3D printer, you can send your parts to [3DHubs.com](https://3dhubs.com) (<https://adafru.it/iNA>) to have them printed and shipped to you.

- [3D Printer](https://adafru.it/fUw) (<https://adafru.it/fUw>)
- [PLA or ABS Filament](https://adafru.it/enm) (<https://adafru.it/enm>) (ABS, PLA, etc.)
- [NinjaFlex](http://adafru.it/1690) (<http://adafru.it/1690>)
- [Screwdriver](https://adafru.it/f76) (<https://adafru.it/f76>)

## 3D Printing



<https://adafru.it/Ile>

<https://adafru.it/Ile>

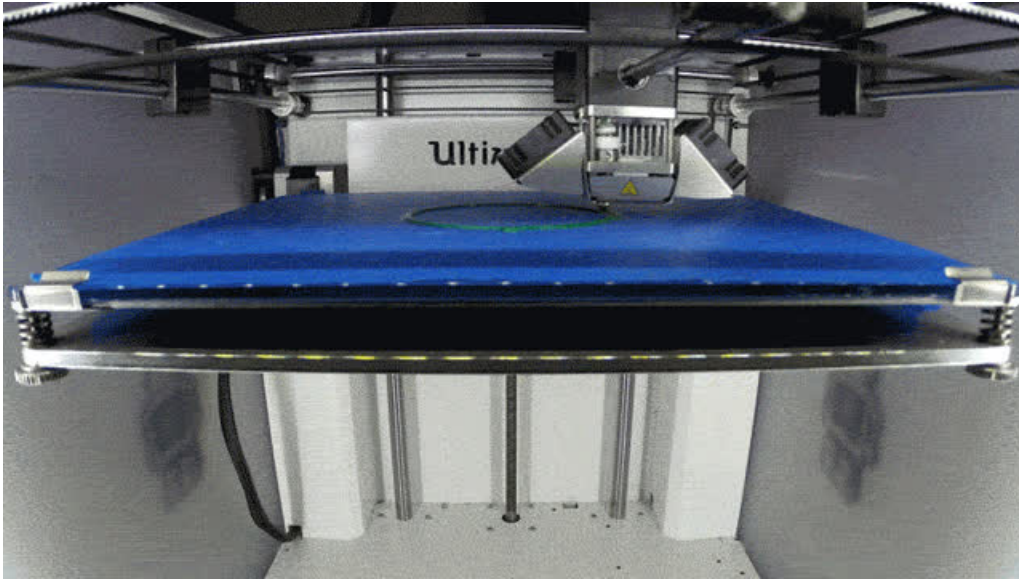
## Printing Settings

Use the settings below for reference. The parts were tested on the Ultimaker 2, Type A Machines Series 1 and the FlashForge Creator Pro. We used Simplify3D to slice the parts using our custom profiles. You can download our profiles for Simplify3D below.

<https://adafru.it/If>

<https://adafru.it/If>

<p><b>GoPro Version</b>  hb-goproinsole.stl  hb-gopromount.stl</p>	<p>220c extruder  90mm/s print speed  120mm/s travel speed</p> <p>use supports for the <b>hb-gopromount</b> version.</p>	<p>About 1 hour for the ring</p>
<p><b>Tripod Version</b>  hb-camount.stl  hb-caminsole.stl</p>	<p><b>NinjaFlex ring:</b></p> <p>230c extruder  30mm/s print speed  45mm/s travel speed</p>	<p>About 1 hour for the NinjaFlex ring</p>



## Customize Original Design

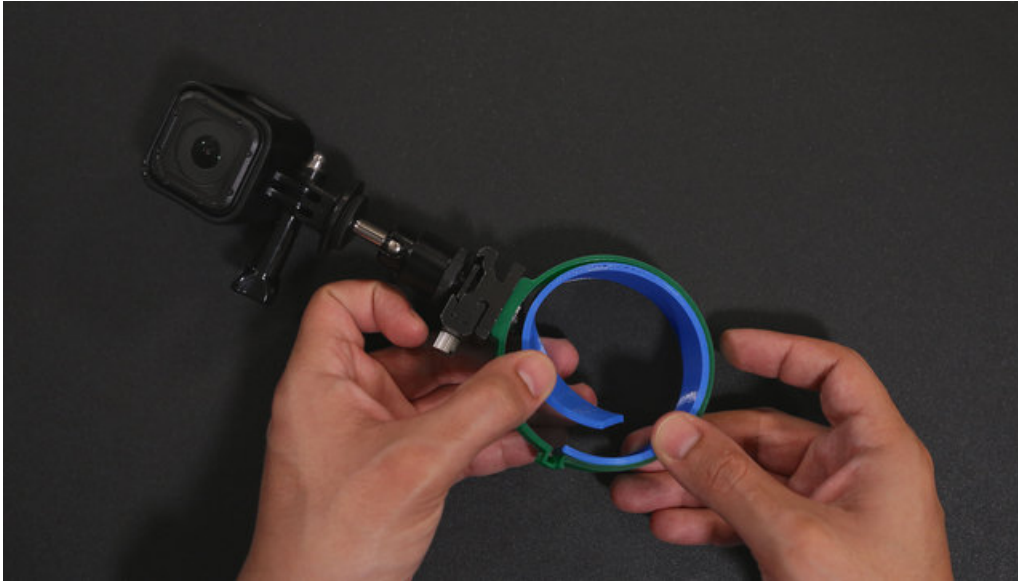
The parts were designed in Autodesk Fusion 360. The design has been made public, and available to download in different formats if you'd like to use a different CAD software package.

<https://adafru.it/kc8>

<https://adafru.it/kc8>

<https://adafru.it/kc9>

<https://adafru.it/kc9>



## NinjaFlex grip

Use Ninjaflex (TPE) filament to print the insole part. This allows the mount to properly grip onto the middle of the hoverboard. **We recommend regular NinjaFlex.**

## Materials

We recommend using PLA material to reduce warping while printing. Although the parts can be printed in different types of filament, such as ABS, PET and Nylon.

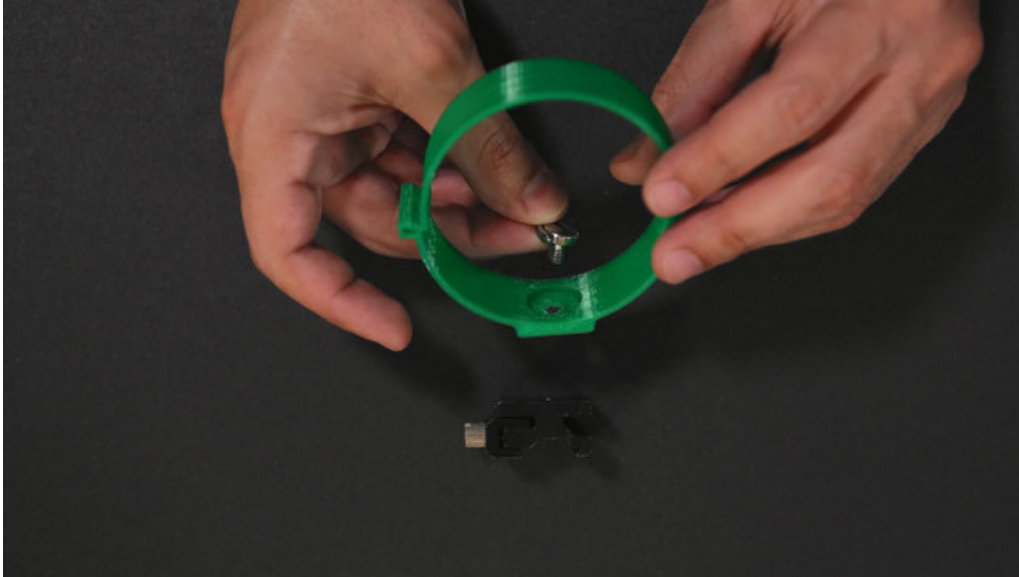
## Tolerances

The parts were tested with common printing settings (listed in the table).

## Bed Leveling

Any parts with large surface require a well leveled build plate. If you're using a heated bed, you can minimize warping. Blue tapers tape, build tak, and sticky adhesives can help keep your part flat and adhere to the bed.

## Assembly

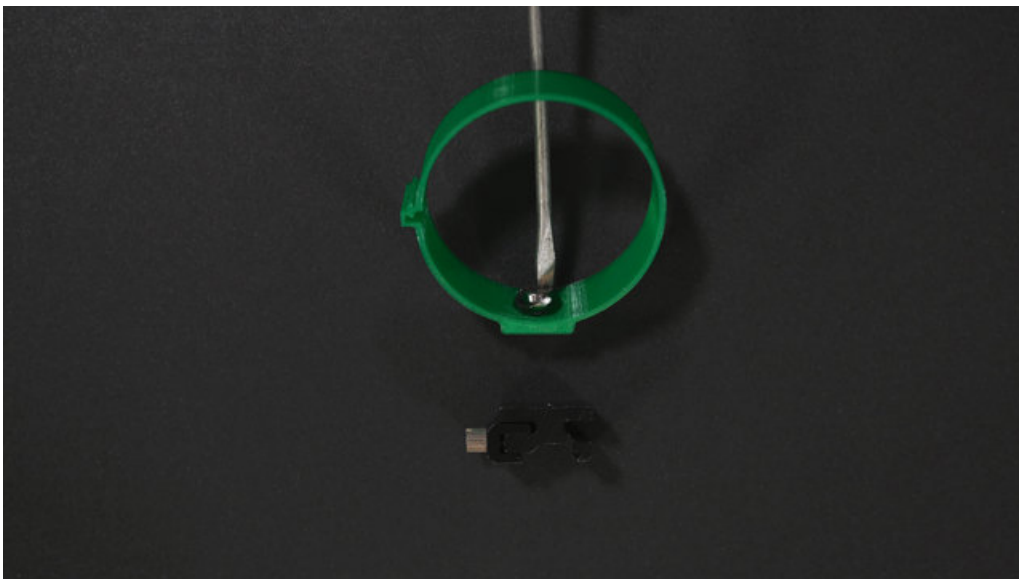


### D Ring mount

The D Ring mount version of the mount is used with the the swivel pan tilt adapter to make it easier to adjust the angle of the GoPro. We can use this mount to avoid capturing your feet while riding the hoverboard. This angle will give us a great "up shot" view of sky when recording.

Be aware the weight of the camera may cause shake in your footage while riding over bumpy ground with this mount. We recommend using the smaller GoPro Session or similar body type cameras when using this version of the mount to avoid excessive shake.

We can minimize camera shake by using the **hb-gopromount.stl** version of the mount.



### Attach cold shoe mount

Insert the D-ring into the hole by fastening through. Place cold shoe mount over the flat side of the part and fasten D-



Ring into the thread of the cold shoe mount.

Tighten the D-ring to the cold shoe mount bracket as much as you can to avoid camera shake or the bracket can loosen over time.



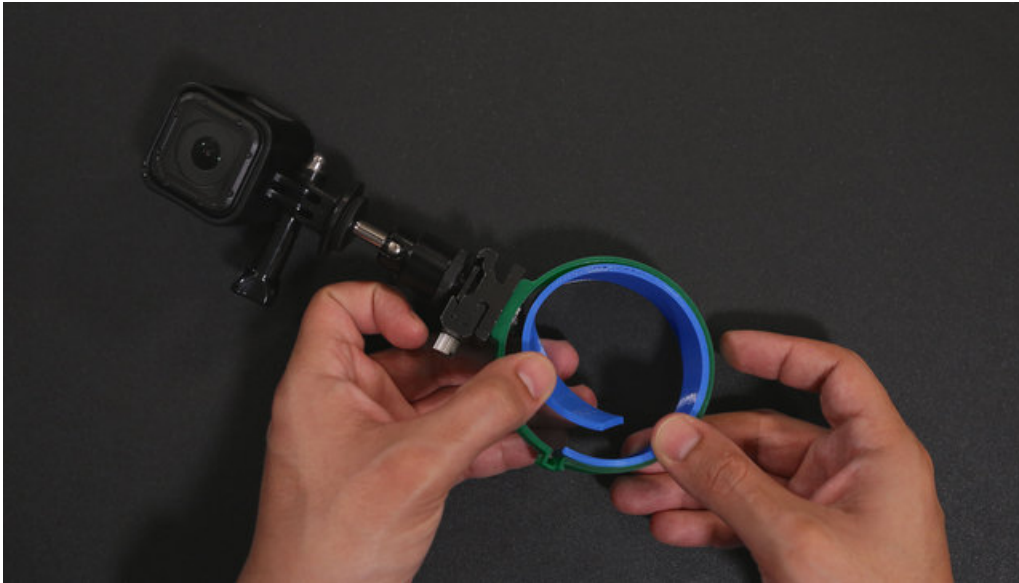
### Attach swivel pan tilt

Slide the cold shoe piece of the swivel head into the cold shoe bracket and make tighten the side screw. You can use a flat head screwdriver to tighten it.



### Add Camera

Attach a tripod adapter to mount the GoPro camera and fasten it to the swivel head. We recommend using a small cube body cameras like the GoPro Session to keep the amount of weight down and avoid excessive camera shake.



### Insert NinjaFlex insole grip

Place the insole on the inside of the clamp. Align and orient the openings together. You can optionally glue the pieces together.



### Final Assembly

Now it's ready to be clamped onto the hoverboard!



## GoPro camera mount

This mount has the GoPro camera mount directly on the clamp. It provides smoother image stabilization because it's closer to the hoverboard. We'll have to be sure to properly frame our shoots to avoid getting your feet in frame.

To make mounting easier, we recommend using the long attachment thumb screw that is included with your GoPro.





## Attaching mount to hoverbaord

Position the mount before clamping in place so the camera is framed towards the front of the hoverbaord.

Pull the two ends of the mount apart like shown in the animated GIF and connect the two clips together so they slide into each other. Firmly join them together to lock them into place.

Unlock the the two pieces by sliding them apart when you're ready to remove the clamp from the hoverbaord.



## Final Assembly

That's it! Now you're ready to get some smooth stabilized shots!