

### Top-Down Modeling: Bike Phone Mount/Holder

Using a top-down modeling approach, design and filament 3D print a phone holder for a bike or scooter. The phone should attach quickly to the holder without separate tools – no screw drivers, hex keys, or similar. When mounted, the holder should allow the phone to rotate between landscape and portraits orientations – again without special tools. The holder should grip the phone securely to resist road vibrations.

Start the model by importing the handlebars and grounding them. Next import a CAD model of your phone at an angle that is likely viewable to you, the rider. Use the handlebars and phone to drive your top-down modeling approach. You should design the holder components in place and then use as-built joints.

#### CAD Requirements:

- At least three individual components modeled with a top-down approach
- Correctly assembled with as-built joints
- Clean organized sketches and features
- Parametric modeling is encouraged

#### Holder Design Criteria:

- *Attaching holder to handlebars* – The holder must securely grip 23-25 mm handlebars (or the dimensions of your bike) without damaging them (e.g., no drilling or set screws). A special tool, such as an allen key, can be used for installation as the holder will be left on the bike between uses.
- *Attaching phone to holder* – The holder should securely grip the phone without inhibiting any of its function, like covering up the charge port or the screen. The phone must be installable into the holder within seconds without a secondary tool.
- *Adjustability* – The holder must be able to lock the phone in a vertical or horizontal orientation, which can be changed at any point during a ride. Additional degrees of freedoms, such as the viewing angle, are welcome but not required.

#### Deliverables:

- 3D printed, functional model tested on a 23-25 mm handlebar or on your bike.
- GitHub Portfolio Entry:
  - Embedded CAD model
  - Multiple pictures of printed model – both standalone and in use
  - Writeup including (~250 words):
    - A description of top-down modeling and how it was leveraged in this assignment.
    - Rationale behind your design
    - Assembly instructions
    - Material choice
  - Be sure to check spelling and formatting of portfolio entry.

**Off the shelf parts:**

- Common fasteners available in the DFL can be used
- Heat set inserts
- 4x Rubber bands