Pupil

An Open Source Platform for Pervasive Eye Tracking and Mobile Gaze-based Interaction
Pupil

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Pupil Dev
Pupil Pro
Pupil Capture  Pupil Player
Performance
gaze estimation error across visual field

accuracy: 0.6 deg
precision: 0.08 deg
system latency

exposure, transport, image formation
pupil detection
write result to queue
read queue, gaze mapping
marker detection, broadcast via Omq
start of sensor exposure

frame time 0.033
0.0063
0.0002
frame time offset

Queue

frame time 0.033
0.119
0.0002
0.0045

latency eye: 0.045s
latency world: 0.124s
Development
Python & C

Open Source Libraries

- OpenCV
- NumPy
- SciPy
- libav
- OpenGL
git clone https://github.com/pupil-labs/pupil/
from plugin import Plugin

class Example_Plugin(Plugin):
    
    def __init__(self, g_pool):
        Plugin.__init__(self)

    def on_key(self, window, key, scancode, action, mods):
        pass

    def on_click(self, pos, button, action):
        pass

    def update(self, frame, recent_pupil_positions, events):
        """
        Gets called every frame.
        """
        # Your code to work with pupil positions goes here.
        # Your code to work with the scene 'world' camera image
        # goes here.

    def gl_display(self):
        """
        Use OpenGL calls to render onto the 'world' window.
        """
        # Your OpenGL calls go here.
github.com/pupil-labs/pupil/wiki
pupil-labs.com/pupil

### Pupil Dev

**Description:** This is the "bare" version, with unpowered cameras and 720p World cameras. It is intended for individuals that want to experiment and use Pupil for their projects.

**Specifications:**

- **Eye Camera:**
  - Maximum Resolution: 640x480 @ 30fps
  - Infrared camera with IR Filter

- **World Camera:**
  - Maximum Resolution: 1280x720 @ 30fps
  - 60 degree view angle

- **Design:** Exposed camera boards

- **Connection:** USB

- **Material:** PLA

### Pupil Pro

**Description:** Pupil Pro is the next step up from Pupil Dev. It has upgraded Eye and World Cameras, improved cable management, and fully enclosed cameras.

**Specifications:**

- **Eye Camera:**
  - Maximum Resolution: 640x480 @ 30fps
  - Infrared camera with IR Filter
  - Adjustable Camera Arm

- **World Camera:**
  - Maximum Resolution: 1920x1080 @ 30 fps
  - 90 degree view angle

- **Design:** Fully enclosed camera boards

- **Connection:** USB with improved cable management

- **Material:** PLA
Pupil

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