

Photonvision Setup

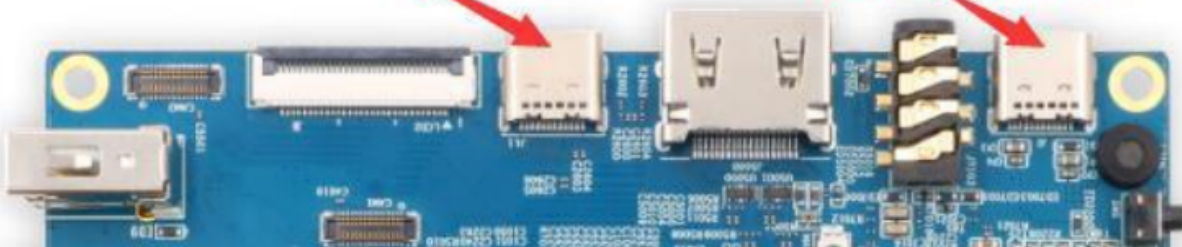
Connect and power the orange pi

The orange pi 5 must have power in the USB port as seen here

There are two Type-C ports that look the same on the development board. The one on the right is the power port, and the one in the middle has no power supply function. Please don't connect it wrong.

This interface has no power supply function

Type-C Power port



You can connect via a wall adaptor or a USB power bank.

Connect the Camera to one of the USB ports.

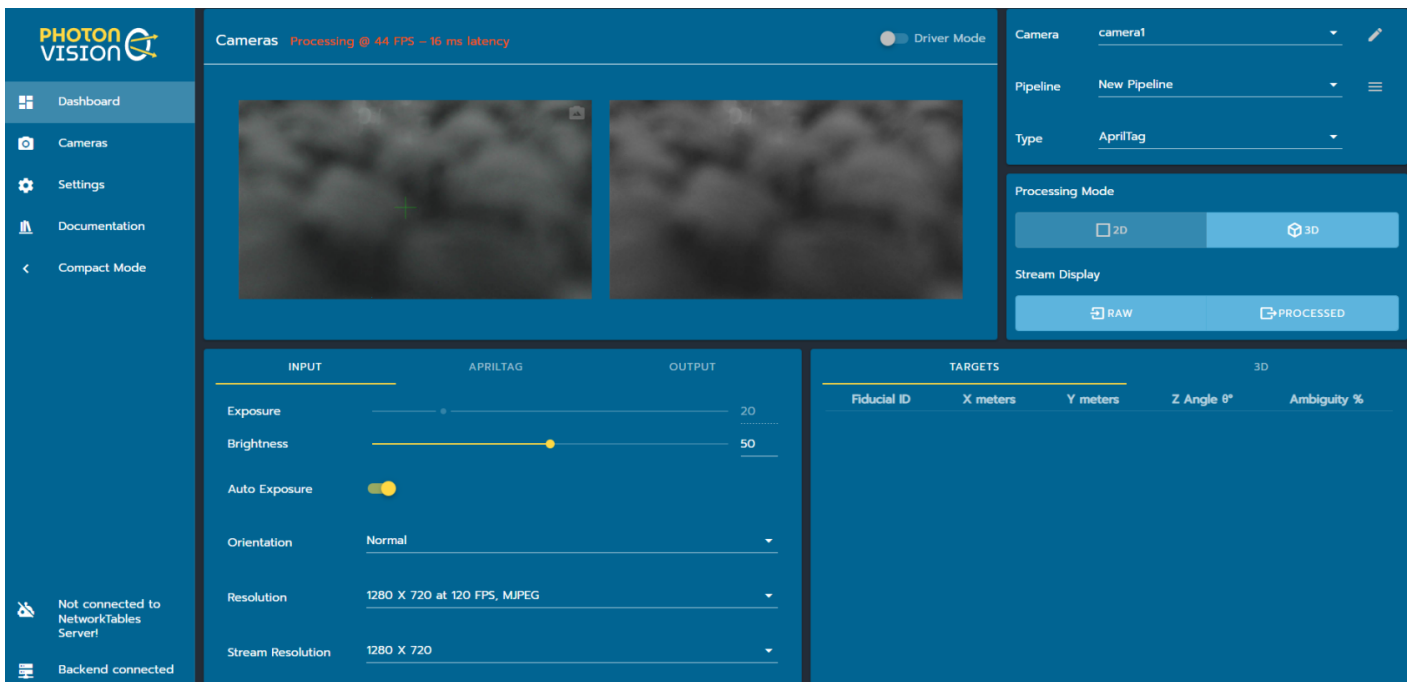
Connect an Ethernet from orange pi into the robot switch (through the tether port possibly)

Connect computer to Robot Radio

Photonvision dashboard

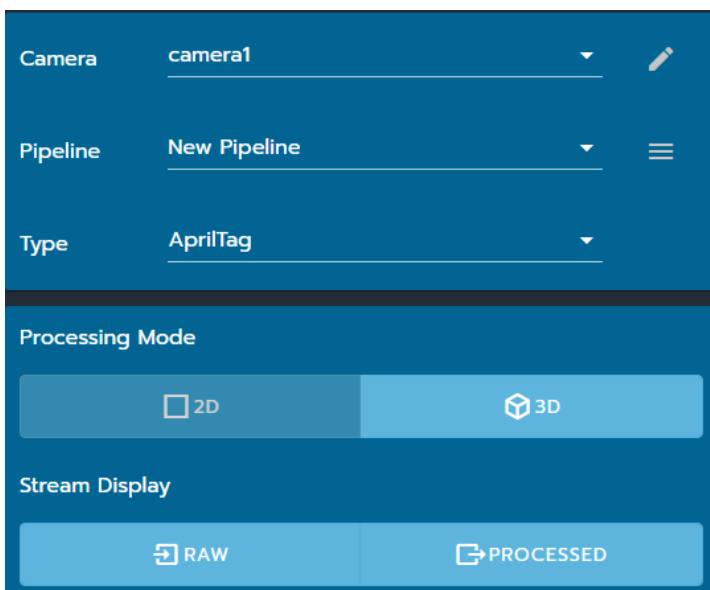
Confirm the dashboard is accessible at <http://photonvision.local:5800/>

You should see



Setting up a pipeline

Select apriltag as the pipeline type



for the input tab select 1200x700 as resolution for the pipeline

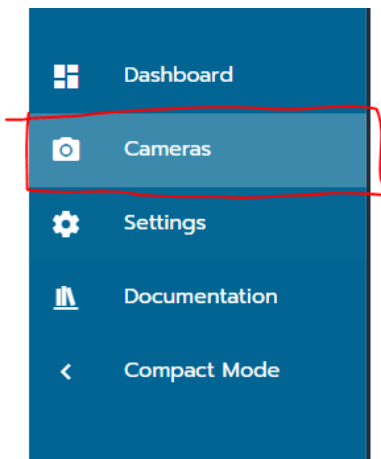
INPUT	APRILTAG	OUTPUT
Exposure	<input type="range"/>	20
Brightness	<input type="range"/>	50
Auto Exposure	<input checked="" type="checkbox"/>	
Orientation	Normal	▼
Resolution	1280 X 720 at 120 FPS, MJPEG	▼
Stream Resolution	1280 X 720	▼

under the Apriltag tab change the following options

INPUT	APRILTAG	OUTPUT
Target family	AprilTag 36h11 (6.5in)	▼
Decimate	<input type="range"/>	2
Blur	<input type="range"/>	0
Threads	<input type="range"/>	6
Refine Edges	<input checked="" type="checkbox"/>	
Decision Margin Cutoff	<input type="range"/>	35
Pose Estimation Iterations	<input type="range"/>	40

Cameras Calibration

select the camera tab



Download the calibration file from our github:

[https://github.com/Team3176/Code_2023_ebot/blob/2024_beta/src/main/java/team3176/robot/subsystems/vision/calib_arducam_backward_0c45_6366_1280%20\(1\).json](https://github.com/Team3176/Code_2023_ebot/blob/2024_beta/src/main/java/team3176/robot/subsystems/vision/calib_arducam_backward_0c45_6366_1280%20(1).json)

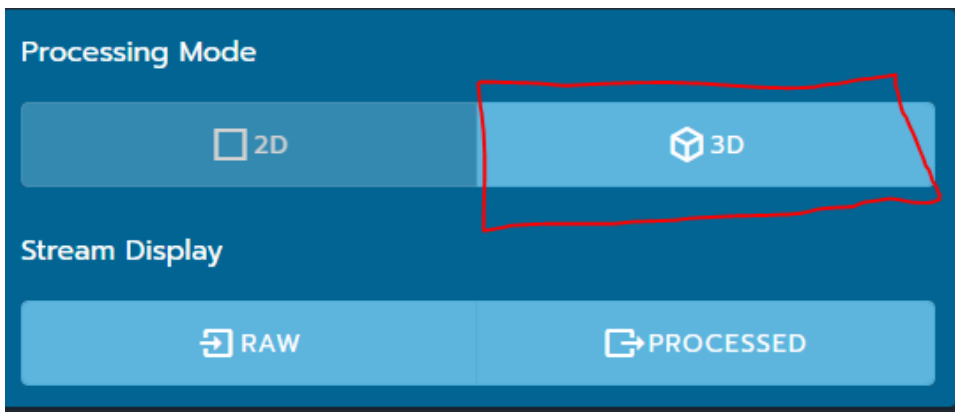
then upload the file to photonvision with the upload from calibddb

A screenshot of the PhotonVision Camera Calibration interface. The interface has a dark blue background with white text. On the left, there are input fields for Resolution (320 X 240), Board Type (Chessboard), Pattern Spacing (in) (1), Board Width (in) (8), and Board Height (in) (8). On the right, there is a table showing calibration results for different resolutions. The 'IMPORT FROM CALIBDB' button at the bottom right is highlighted with a red rectangle. Below the table is a progress bar and two buttons: 'START CALIBRATION' and 'CANCEL CALIBRATION'.

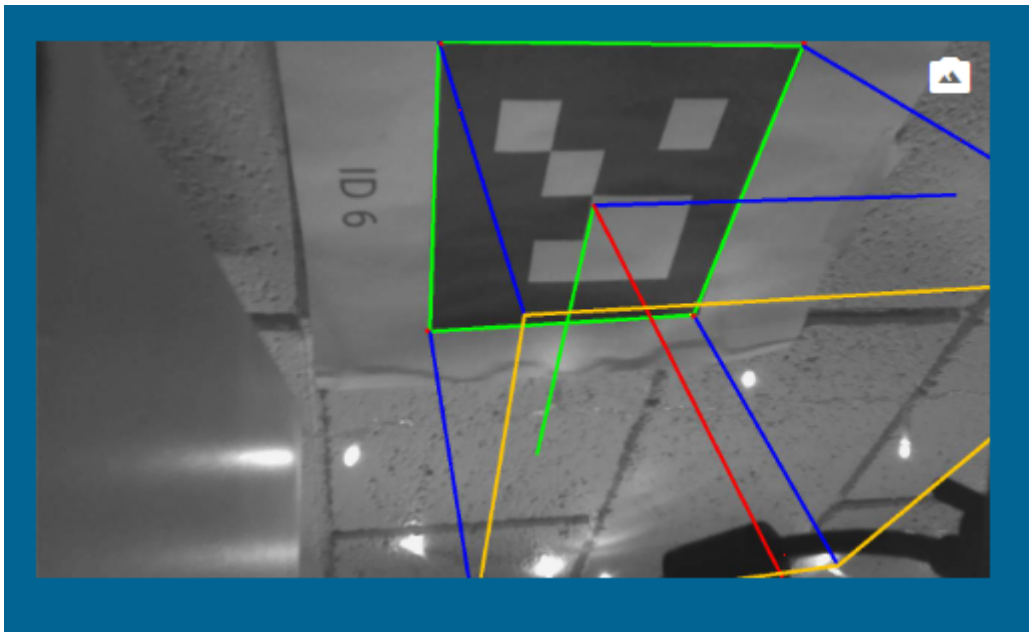
Resolution	Mean Error	Standard Deviation	Horizontal FOV	Vertical FOV
1280 X 800	-	-	-	-
1280 X 720	0.34px	0.00px	72.11°	44.5°
800 X 600	-	-	-	-
640 X 480	-	-	-	-
320 X 240	-	-	-	-

Switch to 3D and test

back on the main dashboard switch your mode into 3d now that the camera is calibrated



you should now if you have a tag in front of the camera see a 3d box



Test and see how far away you can be and still see a tag.

Note down the average FPS and Latency you see with those setting. Feel free to try other settings and see how that impacts performance!

Other Resources

<https://docs.photonvision.org/en/latest/docs/getting-started/pipeline-tuning/about-pipelines.html>

Revision #3

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