

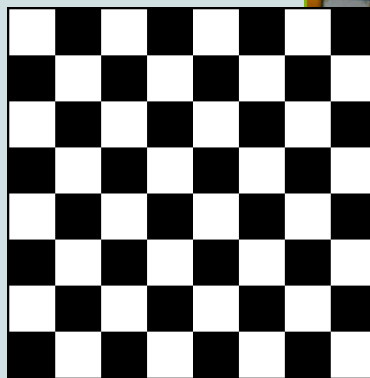


Computer Vision

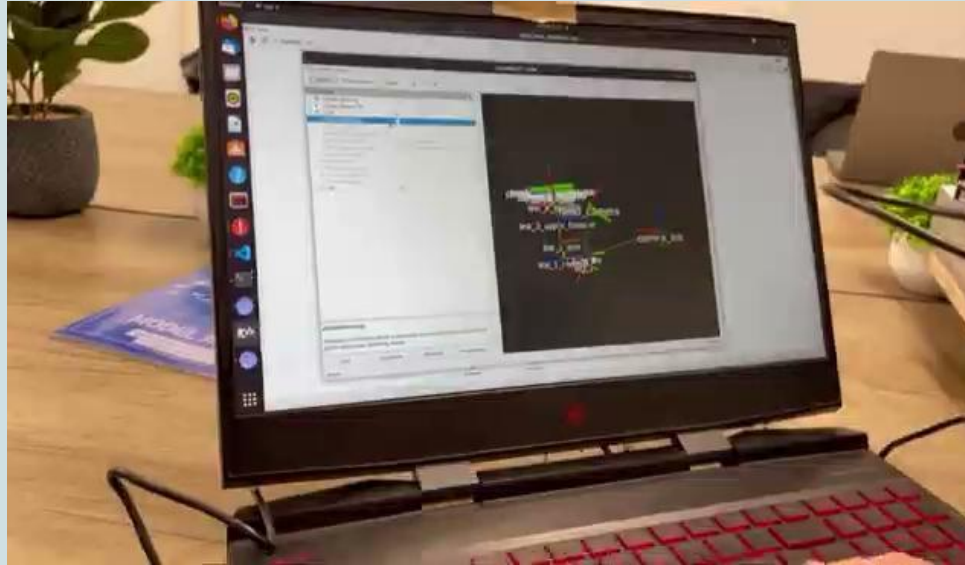
Gabriel Palacios

CURRENT MODULES

1. AprilTag node
2. Monocular Camera node
3. YOLO node
4. Camera Calibration Node
5. Grid node



Camera Node + Apriltag Node

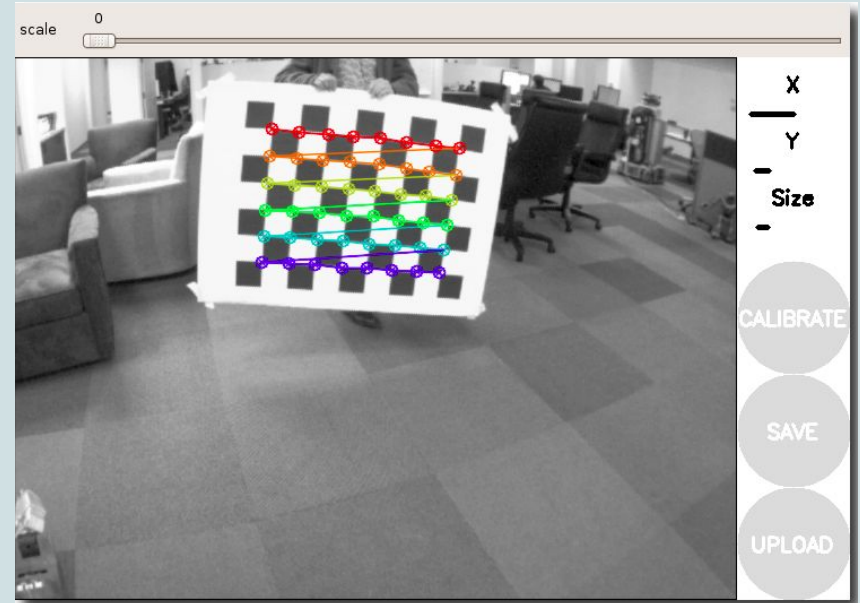


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Grid Node

- Make a grid localizing the pixel coordinates of the intersections in the chessboard
- Send out dictionary relating the pixel coordinates to the position on the board. Ex. {"A3":[top_left, top_right, bottom_left, bottom_right]}



Object Detection

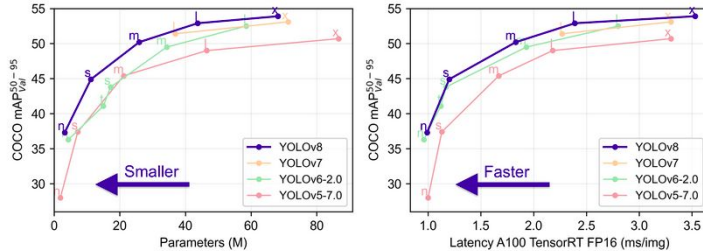
YOLOv8 🚀 NEW

We are thrilled to announce the launch of Ultralytics YOLOv8 🚀, our NEW cutting-edge, state-of-the-art (SOTA) model released at <https://github.com/ultralytics/ultralytics>. YOLOv8 is designed to be fast, accurate, and easy to use, making it an excellent choice for a wide range of object detection, image segmentation and image classification tasks.

See the [YOLOv8 Docs](#) for details and get started with:

pypi package **6.0.203** downloads **14M**

```
pip install ultralytics
```



YOLO ROS: Real-Time Object Detection for ROS

Overview

This is a ROS package developed for **object detection in camera images**. You only look once (YOLO) is a state-of-the-art, real-time object detection system. In the following ROS package you are able to use **YOLO (V3) on GPU and CPU**. The pre-trained model of the convolutional neural network is able to detect pre-trained classes including the data set from VOC and COCO, or you can also create a network with your own detection objects. For more information about YOLO, Darknet, available training data and training YOLO see the following link: [YOLO: Real-Time Object Detection](#).

The YOLO packages have been tested under **ROS Noetic** and **Ubuntu 20.04**. Note: We also provide branches that work under **ROS Melodic**, **ROS Foxy** and **ROS2**.

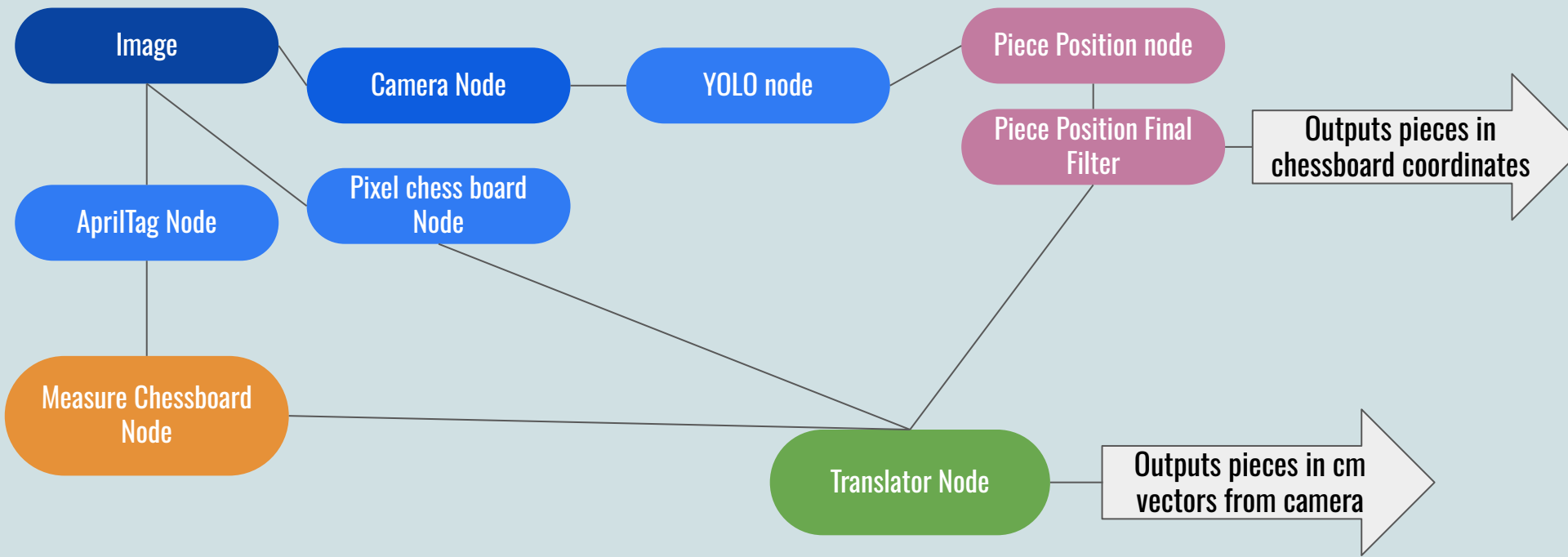
This is research code, expect that it changes often and any fitness for a particular purpose is disclaimed.

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YOLO Nodes

Individual Chess Position

- The node will give a preliminary order on the pieces depending on the chess piece position in which the pieces were found and if one are next to another

Piece Position Sorter

- The node will do the final sorting of pieces in the special cases in which the

Apriltag Nodes

Measure Chess Board Node

- This node listens to the Apriltag Node and gets the position of the camera with respect to the apriltags, from this information assumes the width and height of the chess board, and the dimensions of the internal squares. The output is the position of all the squares in cm and the position with respect to the camera.

Apriltag to cm Node

- The node will give a preliminary order on the pieces depending on the chess piece position in which the pieces were found and if one are next to another

Apriltag Nodes

Translator node

- Listens to Piece Position Final Filter Pixel Chessboard Node and Measure Chessboard node. This node estimates with this information the position in cm of the chess box with respect to the camera.



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