IITB MRT Freshie Induction 2025-26

ROS2 ArUco Server-Client Assignment

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Overview

Implemented ROS2 server-client system for ArUco marker detection per assignment requirements:

- **Server**: Custom service receiving images, returning marker IDs + bounding boxes
- **Client**: Webcam/video input, service caller, prints detections
- **Class-based Python**, Git-tracked, video parameter support

Interface Design

msg/Marker.msg:

```
int32 id
int32[8] bbox  # [x0,y0,x1,y1,x2,y2,x3,y3]
```

srv/DetectAruco.srv:

```
sensor_msgs/Image image
---
Marker[] markers
```

Server Logic (aruco_server.py)

Class `ArucoServer(Node)`:

1. Receives `sensor_msgs/Image`, converts via `CvBridge`
2. `ArucoDetector(DICT_4X4_100)` → corners, ids
3. Each marker: 4 corners → 8-int bbox array
4. Returns `Marker[]` response

Client Logic (aruco_client.py)

Class `ArucoClient(Node)`:

1. `video_path` param: webcam or file
2. 10 FPS timer: `VideoCapture` → `sensor_msgs/Image`
3. Async service call, prints "ID: X, corners: [...]"

Package Structure

```
ros2_ws/src/
 aruco_interfaces/  (msg/, srv/)
 aruco_server_client/ (nodes/)
```