

# Fiducial Marker Navigation for Robotic Systems

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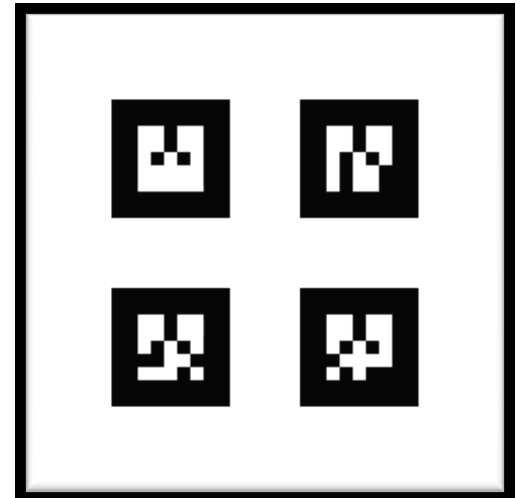
# What I intend to do?

Guide a robot along a random route using a fiducial marker.

- Initially a straight path
- Will then involve turning
- Will contain obstacles – marker still always visible
- Higher obstacles – marker will not always be visible

# Fiducial Markers

- ▶ Bar-code like images containing simple patterns that a camera (along with some software) can easily recognise
- ▶ After being identified, an encoded meaning can be interpreted from the marker using ARToolkit
- ▶ Many criteria for a “GOOD” fiducial
  - Technical criteria
  - Shape of the fiducial?
  - Colour of the fiducial image?
  - Size of the fiducial?



# Environmental Conditions

To increase the accuracy readings with the camera and the lidar:

- ▶ Artificial lighting
- ▶ Room or a hall
- ▶ Obstacles will be simple shapes. For example boxes or tupperware's

# Hardware and Software to be Used

## ▶ Hardware

- WifibotLab Lidar
- Acer Iconia A500
- TP-Link Wireless Router

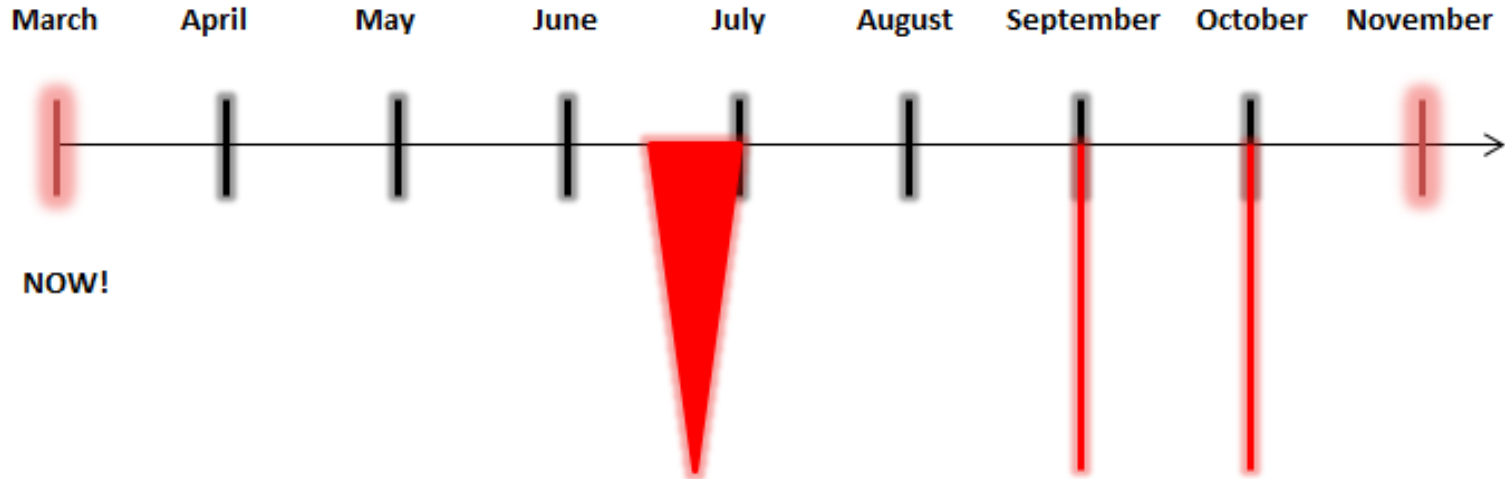


## ▶ Software

- C++
- ARToolKit Library
- Dale Tristram's Generalised Communication Framework



# Main Goals in a Timeline Format



Robot recognising fiducial markers and following in a straight line

Following marker through an obstacle course with marker always visible

Robot navigates through obstacle course even when marker is not visible

# Problems that I Anticipate

- ▶ Hardware issues such as robot not responding correctly

