CSE 276A - Experimental Setup

Henrik I Christensen, UCSD - 2020/10/15

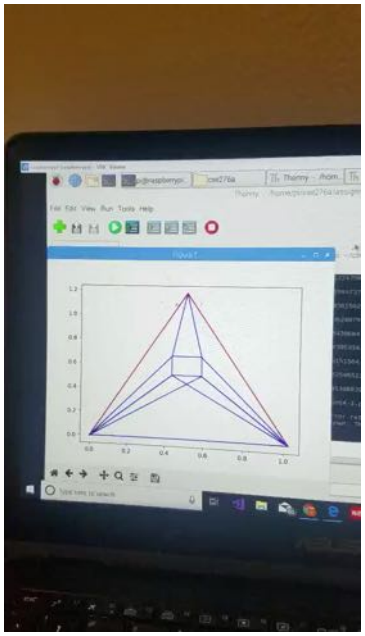
Homework Assignments

- Drive to N waypoints
- Drive to a few targets (objects) - closing the loop
- Build a map of the environment
- Navigate in clutter - Planning / Navigation
- Cover an area (without getting lost)

2019

- Used PiCar
  - Raspberry Pi
  - Narrow Field of View Camera
  - Ackerman / 4 wheel car model

2019 results



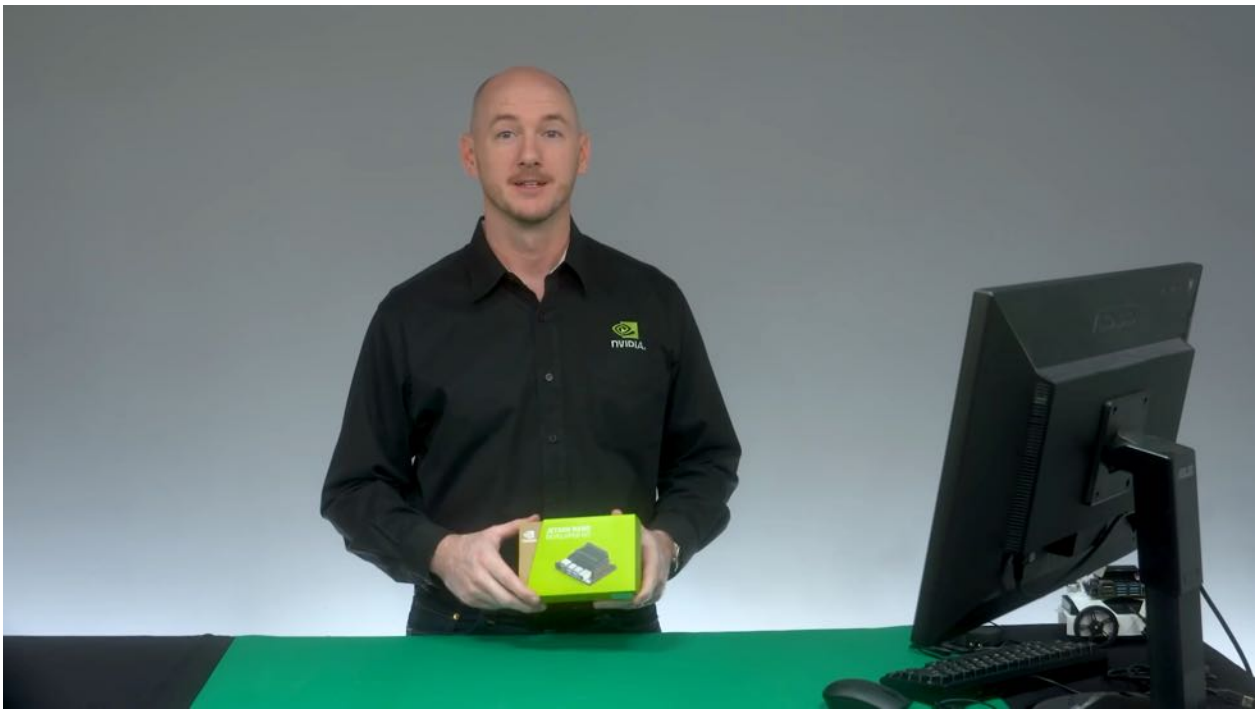
2020

JetBot

- Differential Drive Robot
- 160 deg camera
- Using NVIDIA Nano

NVIDIA Nano

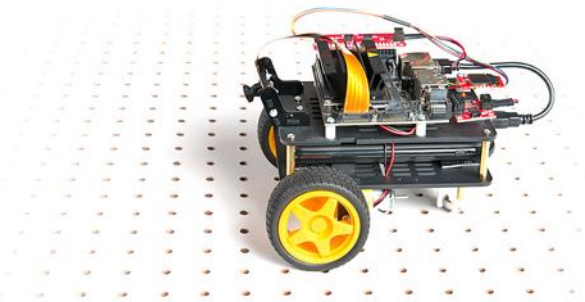
- https://developer.nvidia.com/embedded/jetson-nano-developer-kit



Two Models

- Waveshare

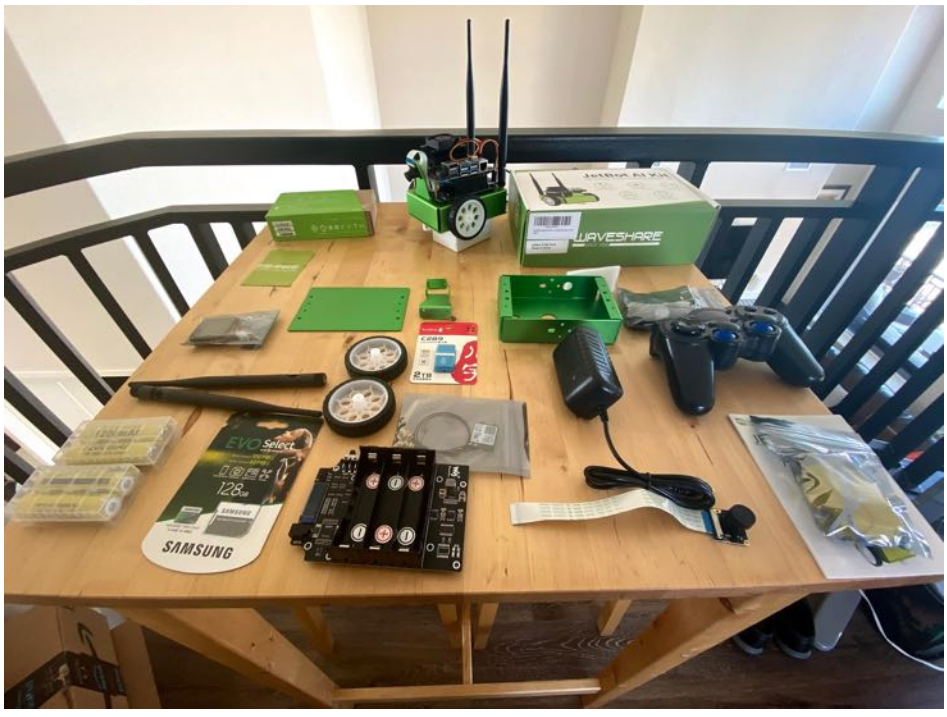
- Sparkfun



Jetbot

https://github.com/NVIDIA-AI-IOT/jetbot

JetBot



Getting started

- See - https://jetbot.org/master/getting_started.html
- Generate the SD card for the Jetbot
- Assemble Robot
- Boot NVIDIA Nano w. SD Card w. Keyboard and Monitor
  - Connect to your WIFI
- Restart wo monitor / keyboard w. Wifi Connection (see display)

SD Card Reader

- https://jetbot.org/master/software_setup/sd_card.html

JetBot Assembly

- Sparkfun
  - https://learn.sparkfun.com/tutorials/assembly-guide-for-sparkfun-jetbot-ai-kit/all
- Waveshare
  - https://www.waveshare.com/wiki/JetBot_AI_Kit_Assemble_Manual
- NVIDIA support
  - https://www.nvidia.com/en-us/autonomous-machines/embedded-systems/jetbot-ai-robot-kit/

Reboot w. Monitor

- https://jetbot.org/master/software_setup/wifi_setup.html

Getting Started

- https://jetbot.org/master/software_setup/sd_card.html
- Connect to robot - http://<ip address>:8888

JetBot ROS Support

- Port / support / install for the Robot Operating System
  - https://github.com/dusty-nv/jetbot_ros

JetBot Examples

- https://github.com/NVIDIA-AI-IOT/jetbot/wiki/examples