EC601 Project 1 proposal

- Problem Statement

  In most supply chains, the final phase of product delivery, from the warehouse or distribution center to the end-user, accounts for about 28% of total transportation costs. Congestion in cities, remote locations, incorrect or erroneous address information, difficult-to-find destinations, and a severe labor shortage for providing on-demand delivery services are all factors that affect last-mile delivery. Thereby, certain factors are contributing to the market growth. Moreover, continued e-commerce expansion, as well as rising consumer expectations for faster and frictionless deliveries, have produced attractive industry growth potential(Source: Facts & Factors).

  Delivery Robot is a complex engineering product in the industry. We need an algorithm about road planning, an algorithm for avoiding obstacles and an algorithm for detecting human and other features. If we can use delivery robots to do delivery, it is possible to reduce the expense of labor for the company. Technology from delivery robots will help us develop self-driving technology.

- Application:

  Security.
  Space Exploration.
  Entertainment. Robots are also a big draw in the entertainment industry. ...
  Agriculture
  Health Care
  Underwater Exploration
  Food Preparation
  Manufacturing.

- an initial list of papers

  1. L. Fridman *et al*., "MIT Advanced Vehicle Technology Study: Large-Scale Naturalistic Driving Study of Driver Behavior and Interaction With Automation," in *IEEE Access*, vol. 7, pp. 102021-102038, 2019, doi: 10.1109/ACCESS.2019.2926040.
  2. R. J. Szczerba, P. Galkowski, I. S. Glicktein and N. Ternullo, "Robust algorithm for real-time route planning," in *IEEE Transactions on Aerospace and Electronic Systems*, vol. 36, no. 3, pp. 869-878, July 2000, doi: 10.1109/7.869506.
  3. E. Nishani and B. Çiço, "Computer vision approaches based on deep learning and neural networks: Deep neural networks for video analysis of human pose estimation," *2017 6th Mediterranean Conference on Embedded Computing (MECO)*, 2017, pp. 1-4, doi: 10.1109/MECO.2017.7977207.

- open source projects to study

  1. https://github.com/IvLabs/autonomous-delivery-robot. Autonomous Delivery Robot

2. ApolloAuto

References: Autonomous Delivery Robots Market Size & Share Value Will Reach USD 55 Bn by 2026: Global Report by Facts & Factors, https://guides.libraries.psu.edu/mlacitation/intext#:~:text=Using%20In%2Dtext%20Citation&text=MLA%20in%2Dtext%20citation%20style,parenthetical%20citation%3A%20(Smith).