Research questions to answer

Which industry do we want to pursue in terms of application implementation (per Meysam's feedback)

A: I think it makes the most sense for us to pursue the agricultural industry (e.g. green house farming, cannabis farms) only because it would be easier to target / filter sensor data (e.g. plants need the temperature to be `x` , the sunlight strength to be `y` , and CO2 levels to be `z`).

What is SLAM?

A: SLAM (Simultaneous Localization and Mapping) is a way for a robot to (1) map its environment and (2) localize itself (e.g. know where it is in space) all at the same time. SLAM works by:

- Using sensor data to collect information in its environment (in our case, Lidar)
- Using odometry to estimate its relative location to landmarks it has identified in environment (e.g. I was at point `A` , I then moved forward `12` inches at a `30` degree angle and I am now at point `B`). odometry can be derived by also using other sensors such as:
  - IMU to determine acceleration, angular rate, and orientation
  - Wheel encoders to determine distance traveled due to IRL errors (e.g. a wheel slipping)

- using both of the information above, you can derive a more accurate odometry as an object traverses space

> ⚠️ **Note about odometry**
> We should `define` these "cells" as we traverse the unknown area (e.g. the "cell" could be a 12"x12" square depending on robot size)

- [For large scale mapping, an optimization strategy for solving SLAM in factor graphs has been proposed.](#))
- Good visualization of above: [Easy SLAM with ROS using slam_toolbox](#)
- An intro to SLAM: [Active SLAM: A Review On Last Decade](#)

What is deep learning?

A:

Source:

How should SLAM be implemented with deep learning (per Meysam's feedback)?

A:

Source: