Term Project Proposal

Summary:

For my term project, I am planning on building a drone from scratch. The drone will use photogrammetry to map a household. It will then use object recognition to recognize simple objects. Finally, there will be an interface where I can ask the drone where a specific object is in the house, and it will be able to tell me. Something like “where is my water bottle”, with a reply of “the living room”.

The stretch goal is to have an arm attached to the bottom that can grasp small objects, so instead of simply telling me where my pen is, the drone can grasp the pen and bring it to the room that I specify.

I believe that this is a challenging project due to the use of object recognition, photogrammetry, and inverse kinematics, plus designing a working flight control and 2DOF robot arm control system.

Parts:

- 2 Propellors
- 2 High speed brushless motors
- Arduino
- Wifi connectivity board
- Motor control board
- Battery
- Drone chasis components

Programming Requirements:

- Drone control system (model, planning, control)
- 2 DOF Arm control system (model, planning, control)
- Image recognition and photogrammetry overlay
- Drone / user interface (voice, application… currently unknown)

Bare Minimum:

- Drone that can accurately autonomously map a household
  OR
- Drone that can pick up a target object that is placed within its line of sight

Overall Goal:

- Combine photogrammetry, object recognition, and modelling, planning, and control, to create a useful autonomous drone.

Feedback or guidance is welcome. Thank you.