11/8/18

**Robot Data Visualization**

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**Component Specification**

Component Specification:

* Software components. High level description of the software components such as: *data manager*, which provides a simplified interface to your data and provides application specific features (e.g., querying data subsets); and *visualization manager*, which displays data frames as a plot. Describe at least 3 components specifying: what it does, inputs it requires, and outputs it provides.
* Interactions to accomplish use cases. Describe how the above software components interact to accomplish at least one of your use cases.
* Preliminary plan. A list of tasks in priority order.

Software components:

* Data\_loader
  + Objective: Downloads dataset into “data” folder as a CSV file. Then, the dataloader should load the CSV file and provide a nice interface for requesting data.
  + Input: dataset to download
  + Output: filtered data for the use of the SLAM algorithm
* GUI
  + Objective: Provides a nice interface for the user to interact with the data.
  + Input: Dataset and SLAM algorithm selection
  + Output: Visualization of robot’s data in the world frame.
* SLAM algorithm
  + Objective: Generate global map and robot path.
  + Input: Time series robot data in the robot frame.
  + Output: robot pose and global map at current step in data

Interactions to accomplish use cases:

* Use case (Use the data to generate route/map) interactions:
  + Data\_loader to load data, cache it, and provide an interface for requesting the data.
  + User choose a button and GUI will connect to the functions used
  + When SLAM function is called in GUI, the SLAM algorithm will run and display the result in the viewing window

Preliminary plan:

* **Task 1: Due 11/13 (Hao and Robin):** Dataset and develop Data Loader
* **Task 2: Due 11/16 (Ken):** Generate GUI that displays robot data
* **Task 3: Due 11/23 (Hao and Robin + Ken):** Overlay google maps data and robot path data
* **Stretch Task 4: Due 11/26 (Ray):** Setup algorithms available in Python Robotics Library and implement SLAM