Kidnapped Vehicle Project - Particle Filters

The goal and objective of this project is to implement a 2-Dimensional particle filter to localize and locate a kidnapped vehicle.

We start with a GPS measurement and add some gaussian noise to determine a local 2-D space around the GPS measurement. Subsequently, based on the relative location of landmarks as estimated by a moving measurement system on the vehicle, particle filter can localize and figure out instantaneous location of the vehicle.

This particle filter uses the CTRV motion model and can get a decent level of accuracy in estimation. The main tuning parameter is the number of parameters. Initially, 1000 particles were used to determine and localize the vehicle. Subsequently, 500 particles were chosen as a final number of particles. More time can be spent to get the optimum number of particles. The objective of this project is to implement and understand the particle filter and hence more time was not spent on fine tuning.

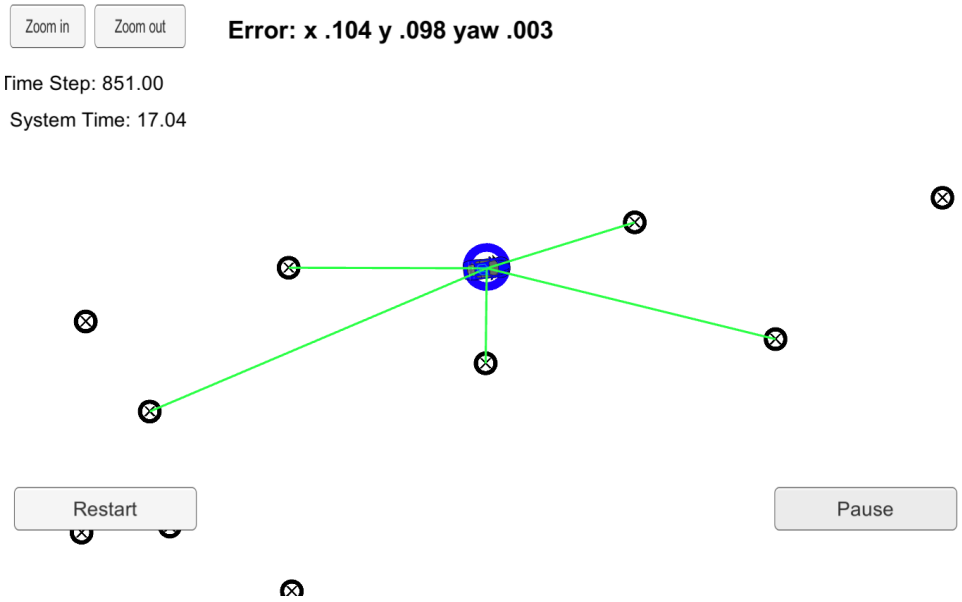

Fig1. Particle Filter predictions shown by blue circle

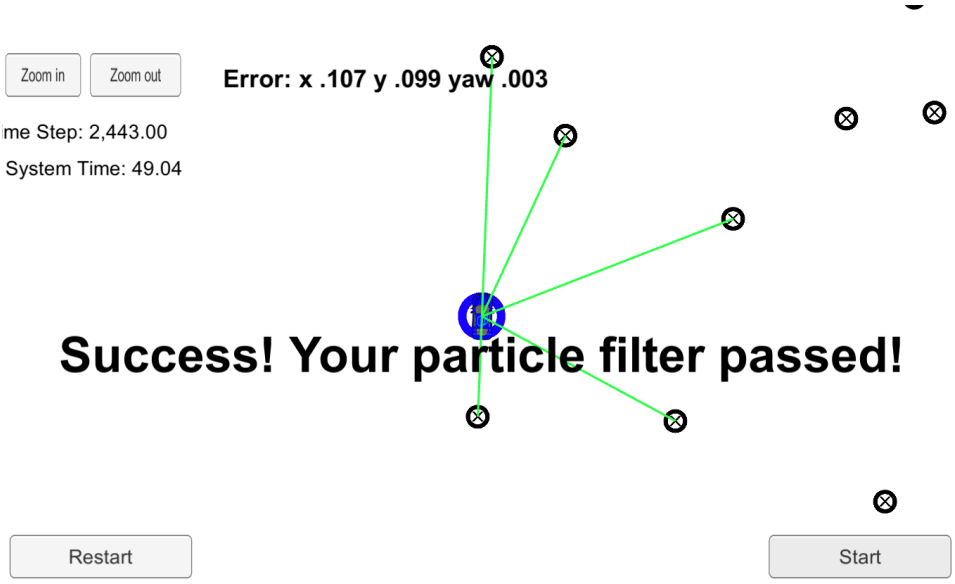

Fig2. Particle Filter successfully run as per the project rubric instructions