Introduction
This is a brand new system with RFID sensors and transmitters to perform indoor localization. RFID (Radio Frequency Identification) technology is using radio signals to send and collect data. Octopus card is one of the examples of RFID technology. This project tries to combine RFID technology and localization algorithms to conduct indoor positioning. This system gives accurate coordinates of targets’ location in a short period of time and the accuracy is proved by Gaussian Process Regression.

Objective
Develop an indoor positioning system using RFID technology and help normal family to locate small objects such as keys which is hard to find.

Methodology
- Localization using NNLS algorithm $\delta_i = \sqrt{\sum (y_i - \hat{y}_i)^2}$
- User-friendly software to display the position
  - Gaussian Process Regression to show distribution pattern

Results
- The system can read RSSI signal and manipulate coordinates
- Error of position is within 1 meter
- New position received every 2 seconds
- Number of tags can be tracked is up to 80