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* Low-cost sensor for seamless road quality monitoring
* Problem: The road quality monitoring is regularly conducted by specially designed instrumented vehicles, which requires much time and money. In addition, it is hard to make sure that Road Pothole can be detected immediately, because of the limited number of these vehicles. Sponsors need the road quality monitoring to be conducted by every car running on the road.
* Solution Overview: By installing accelerometers and gyroscopes to the private cars, the data describing driving condition of the cars can be collected. The signal from these sensors and GPS in the cars will be transmitted to online server. With the pre-trained model implemented, the server will label the roads to be safe or not.
* Solution Components
  + Detecting System
    - A group of accelerometers detects the changes in car driving conditions.
    - A gyroscope detects the condition of car. It helps to normalize the data from accelerometer, since the direction of detection is not always along the direction of running.
  + Filter System
    - The signal from sensors will be divided into segments. If all segments are transmitted to server, this will create an excessive load to the system. A filter system will be implemented on PCB to filter segments that is less likely to have problems.
  + Label System
    - A label system implemented with method of machine learning will be deployed on server to label the road segments to be safe or not.
* Criterion for Success
  + Whether the sensors can collect sufficient data.
  + Whether the cost of installing these sensors and PCB with filter system is low cost.
  + Whether the server can receive the signal successfully
  + Whether the model can make decision with high accuracy
* Distribution of Work
  + Detecting System – Zhengwei Dai
  + Filter System – Yuhang Chen
  + Label System - Yichen Li, Yihang Yang