Toward Constructing Disaster Mitigation Community Sensor Network in Yokohama, Japan

Since Japan is one of the most seismically active countries in the world, a nationwide dense seismic network has been developed for seismic monitoring. However, the current distribution is not enough to issue the effective earthquake early warning (EEW) within ~30 km of the epicentral area. In addition, although the strong ground motion and the response of a building to shaking is important information for the disaster mitigation, to get the information, even more seismometers is required and the cost will be unrealistic amount of money for the national government disbursements.

To address this issue, we developed a community based MEMS sensor network in the metropolitan area Yokohama, Japan. The project aims to distribute the sensors every several hundreds meters in the area to provide information more closely linked to community's life. As a first step, we developed a sensor unit which detects strong motion and process the data. The unit is composed of 12 bit MEMS sensor and Raspberry pi. The sensor unit is linked to Twitter and shares the information with the users. The initial installment costs about $100 US dollars, which is much less expensive than the conventional seismometer. However, for the long-term maintenance of the network, support of community is mandatory. From this point of view, it is still too expensive if the immediate benefit is only getting on-site EEW.

To develop more practical and beneficial sensor unit for the community, we hold workshop with them regular basis and share the idea through a discussion. The practical idea is then implemented to the sensor units. Sometimes the idea is not related to seismic monitoring, but is based on the function of accelerometer, such as taking care of elderly person lives alone. In this presentation, we will introduce some from those ideas, implementations, and the operation examples.