**Introduction**

Ocean covers 70% areas of the earth and waits for being explored for a long time. With the advances of technologies, underwater wireless sensor networks (UWSNs) become a powerful tool to explore oceans. UWSNs deploy a large amount of static and mobile sensor nodes underwater to sample, detect, collect and transfer information. A wide range of applications for UWSNs can be described as follows:

* **Oceanographic data collection:** underwater sensor nodes can detect the characteristics of the ocean like temperature and pressure.
* **Environmental monitoring:** the oceanographic data collected by sensor nodes can not only help with pollution monitoring but also improve weather forecast.
* **Offshore exploration:** UWSNs are applied in undersea resources exploring like underwater oilfields detection, and they can also help with laying undersea cables.
* **Disaster prevention:** The disaster warnings acquired from the data measured from remote locations can effectively reduce losses caused by disasters such as tsunami.
* **Assisted navigation:** the localization of dangerous rocks and mooring positions can be achieved with the aid of sensors, which will avoid hazards during navigation.
* **Distributed tactical surveillance:** AUVs and sensors can help with Military action like underwater warfare, submarine navigation, submarine attack, and submarine hunting in the field of target detecting.
* **Mine detection:** AUVs and sensors can be used to achieve rapid environment assessment and mine-like object reconnaissance.

Communications and localization are two fundamental technologies to support UWSNs. Underwater communications facilitate the information exchange among sensor nodes. Meanwhile localization tags position information for sensor nodes to signify their collected information. Since acoustic signals are the only carriers to enable underwater long-distance communications, our research focuses on communications and localization based on acoustic signals for UWSNs. Our main research topics are listed but not limited to as follows

* OFDM based underwater acoustic communications
* Implementation of underwater acoustic modem
* Underwater acoustic ranging
* Joint underwater acoustic localization and synchronization

This page is maintained by Qi Dong (Master Candidate) and Fangling Yao (Master Candidate) from Department of Automation, Shanghai Jiao Tong University, Shanghai, P. R. China.