As one of the current hotspots in the market of mobile wireless connectivity, especially for IoT, the UWB technology enables wireless data transmission at high data rates and accurate localization at the centimeter level. Since Apple released U1 chipset on iPhone 11 in 2019, mobile device providers worldwide have put a lot of effort into the development of UWB technology for their platforms. Soon, more and more mobile devices, e.g. smart phones, will support the UWB feature.

In addition to its good reputation for communication and localization, UWB is a competitive technology in the field of healthcare, considering its good penetration ability and fine time resolution. The proposed research is aimed at exploring the opportunity of using the UWB sensors on smart phones to monitor vital signs, such as respiration and heart rates. Monitoring our health conditions without any wearable devices is an exciting prospect. For example, you can know your health information on your smart phone while do not have to pay for an expensive smart watch.

In this research, it is important to distinguish the interest signal that carries vital signs with other interference signals (multi-paths). And the timestamp-based method and maximum likelihood estimation will be applied to extract vital signs, such as the respiration period. In the end, the system verification will be implemented on the Keysight UWB testbed, which is constructed by a signal generator and a signal analyzer.