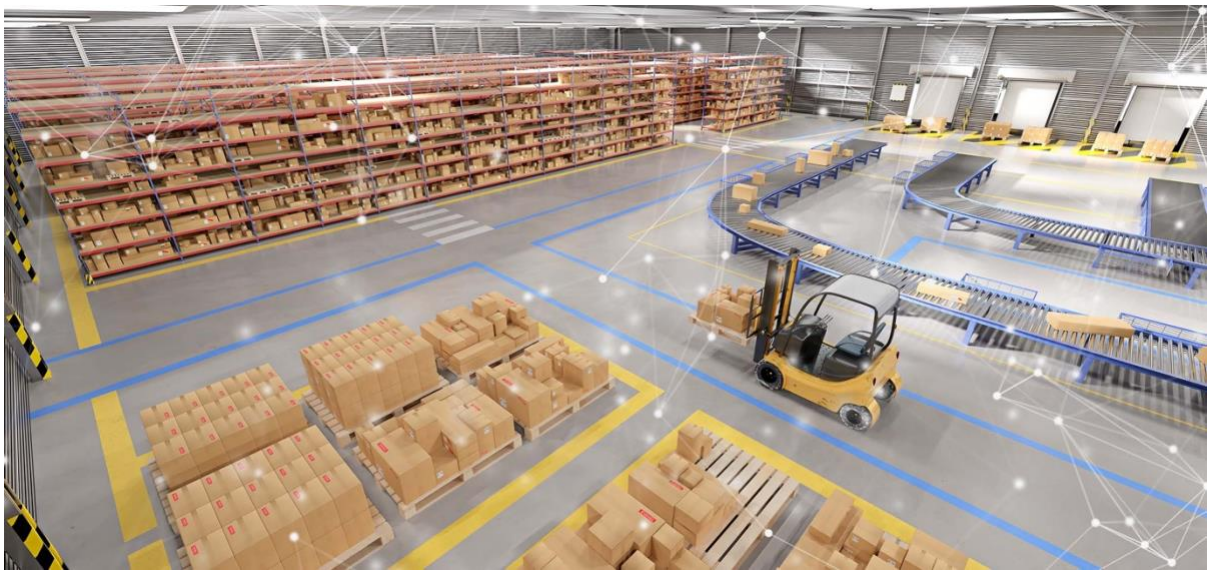
Indoor path planning and navigation of robots via Ultra-Wideband Wireless Technology

Bachelor / Master thesis

Supervisor: Prof Themistoklis Charalambous
Co-supervisor: Mr Evagoras Makridis, Dr Kyriakos Deliparaschos

Description:
In the last recent years, unmanned aerial vehicles (UAVs), such as quadrotors, have become very popular due to the wide variety of applications, such as, surveillance, inspection, industrial tasks, delivery, agriculture, and data acquisition. Most UAVs use GPS-based positioning system which is suitable only for outdoor environment localization. Robots (e.g., quadrotors), however, are used nowadays for several indoor applications, such as, object transportation, inspection and delivering parts. Because of these and other foreseeable applications, research in indoor localization systems for UAVs, such as quadrotors is becoming a necessity. In this project, we focus on the deployment of an UWB localization system for indoor path planning and navigation of robots, as shown in the picture below.



Keywords: robots, indoor navigation, localization, control, ultra-wideband technology.

Deliverables:

- A demonstration of a working example
- A thesis in which the current state-of-the-art is briefly described, the design of the working example is thoroughly explained for the hardware, the software and the theory supporting it.

Work type: 10% literature review, 60% simulations, 30% theoretical analysis

Tools: ROS, Python, C++

References:
[1] “Pozyx,” real-time location systems (RTLS) for indoor tracking based on UWB (ultra-wide band) technology. [Online]. Available: https://www.pozyx.io/