

# GRID 2.0

## Robotics Problem Statements

### Intelligent Picking

A lot of manual effort is required today in a warehouse in locating and picking the items. While there have been advancements in picking automation in terms of robotics arms and whatnot, there are still unique challenges if there are different types of SKUs which also require lightning-fast picking.

The aim is to come up with a versatile picking robot, which is able to pick various types of small items (<1kg) placed in different orientations from a grid of shelves and stow it into a designated area, without compromising on speed.

### Autonomous Indoor Drone

Drones have recently garnered a lot of attention in all sorts of domains including supply chain. While autonomous drones have achieved decent maturity in outdoor environments, conventional drones still struggle to perform in an indoor environment such as a warehouse. The main reason for this comes from the fact that in outdoor environments, drones could rely on global navigation systems such as GPS for their position and velocity estimates. However, when it comes to an indoor environment there is a lot of scope of innovation in sensors and processing.

The aim is to come up with a compact drone capable of navigating across a warehouse indoor and be able to achieve targets like crossing highlighted squares/rings.

### Autonomous Stair Climbing Robot

Logistics is all about movement from one place to another. This movement happens across facilities and within facilities. While AGVs have found their way into applications of material movement inside a warehouse, they are designed to move across flat surfaces with minor undulations (in some cases requiring specialised mezzanine surfaces).

The Aim is to come up with an autonomous robot which can work on flat surfaces and even climb up and down standard stairs with a payload of 3-5kg.