

# Artificial Intelligence and Building

*Eugene Chian, Research Associate | 15<sup>th</sup> June 2020*

Artificial intelligence (AI) is a machine performing a set of instructions repeatedly to fine tune its calculations, so that the machine can improve its performance on the calculation. The construction industry is still underserved by AI, as construction is complex work taking place in the physical world. Here are some potential computing milestones that may occur before we can see construction become more automated:

## **Turning 2D drawings into 3D models**

Currently, design is typically done in 2D drawings and then rendered as a 3D BIM model, with both of these steps being done by hand. If a machine is able to automatically convert 2D drawings into 3D models, it can save on the labour needed to re-draw a 2D drawing as a 3D BIM model.

## **Reading architectural plans and construction drawings**

The AI needs to be able to read architectural plans or construction drawings to know how to construct the building. For example, it will need to know where to install columns, beams, doors, windows, etc.

## **Pinpointing an exact location (x,y,z) in space**

The AI needs to be able to pick up precast modules and lift them into place on the construction floor. At both the starting point and destination, it needs to know the exact spatial coordinates of the locations of things.

## **Recognizing dangers and obstructions on construction site**

As a construction site is full of danger and obstacles, the AI needs to be able to predict dangerous outcomes and halt activity if there is a hazardous situation. SaRRU is currently working on using computer vision to detect workers at an open edge of the construction floor, under a lifted load, and those who are too close to each other if there is a need for safe distancing.

