

Autonomous Vehicle

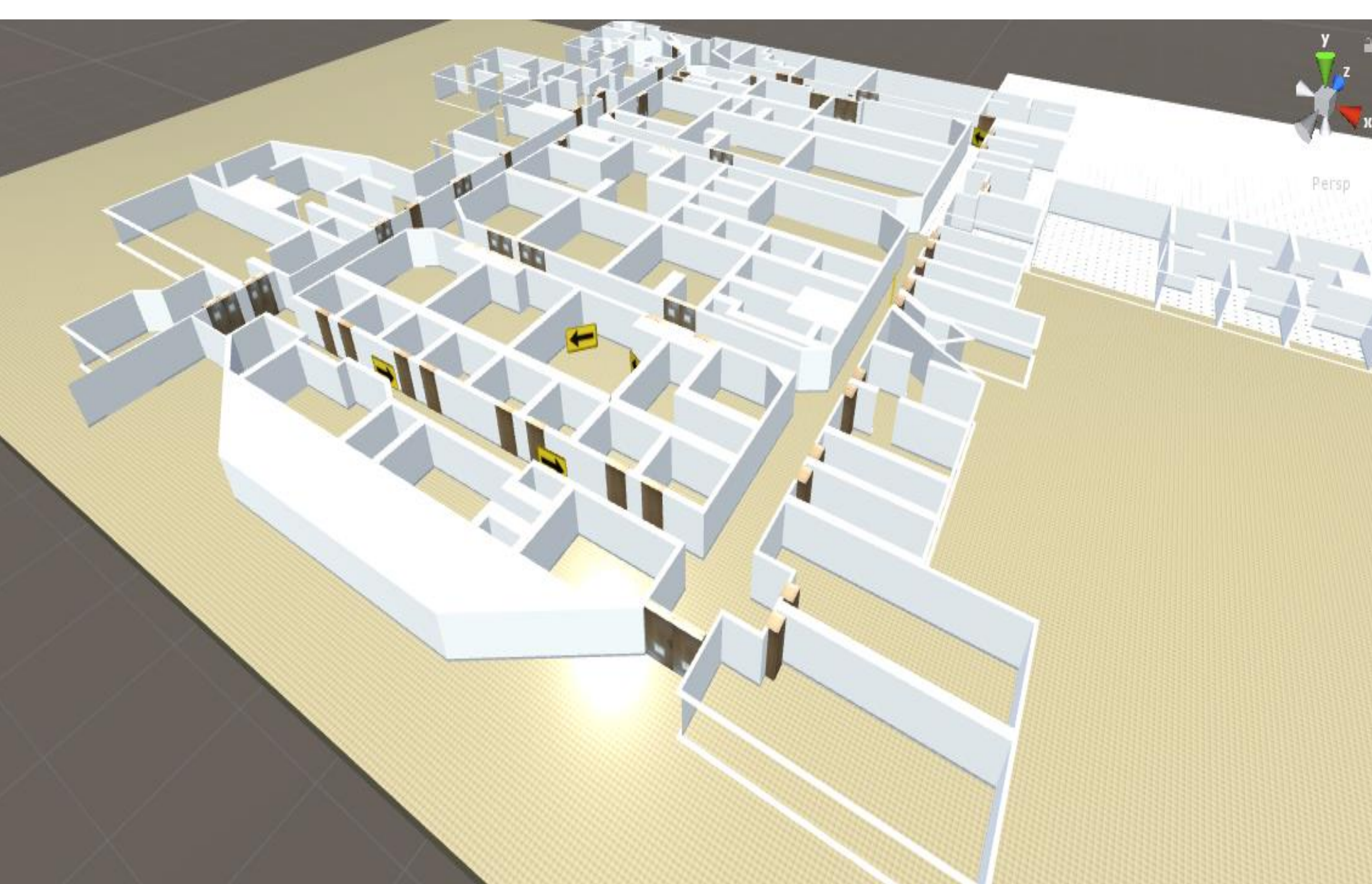
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Overview

Neural network drives a car using a camera and the Nvidia TX2 ARMv8 processor. A loss of link signal, kill switch and Lidar are used for collision avoidance. The goal is to teach a neural net how to drive, and driving in the Engineering building is just a demonstration of that goal. This test bed is useful for cyber security verification testing of autonomous vehicles.

Key Findings

- Successfully navigated simulated Engineering Building using a neural network.
- The car model is constructed to navigate using a neural network.
- Start early on your project - hardware development often lags behind software.



Udacity Simulator EB Model



EB Hallway

Impact

Driverless cars have the potential to greatly reduce traffic deaths from the current standard of over a million annual auto-accident related deaths in the world. Due to disabilities or old age, some people are unable to drive cars. These people can gain autonomy using autonomous cars.

Explanation

Our research investigates how well a neural network can drive in the real world autonomously using synthetic trained data versus real world trained data. It can navigate without collision using only 13,600 frames of turning data, and 700 frames of straight hallways. The use of street signs allows for path planning decisions without the need to use waypoint navigation.

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