

Floor Feedback System for the Intelligent Work Cell

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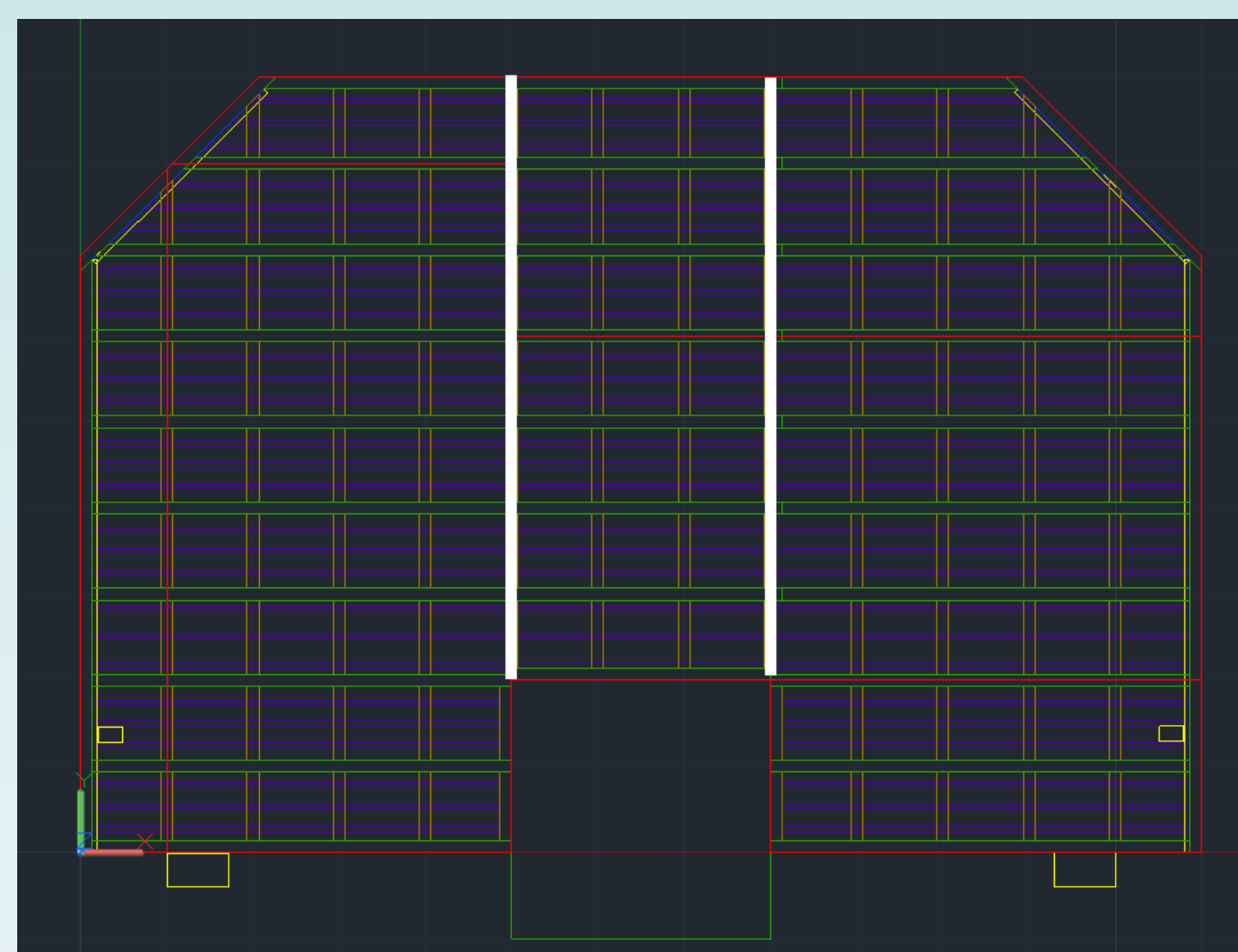


Introduction

The purpose of the Intelligent Work Cell is to make safe human-machine coexistence possible in the manufacturing world. The focus of this project was to provide an integrated floor visual system to quickly alert users of conflicts arising between themselves and a robotic manipulator.

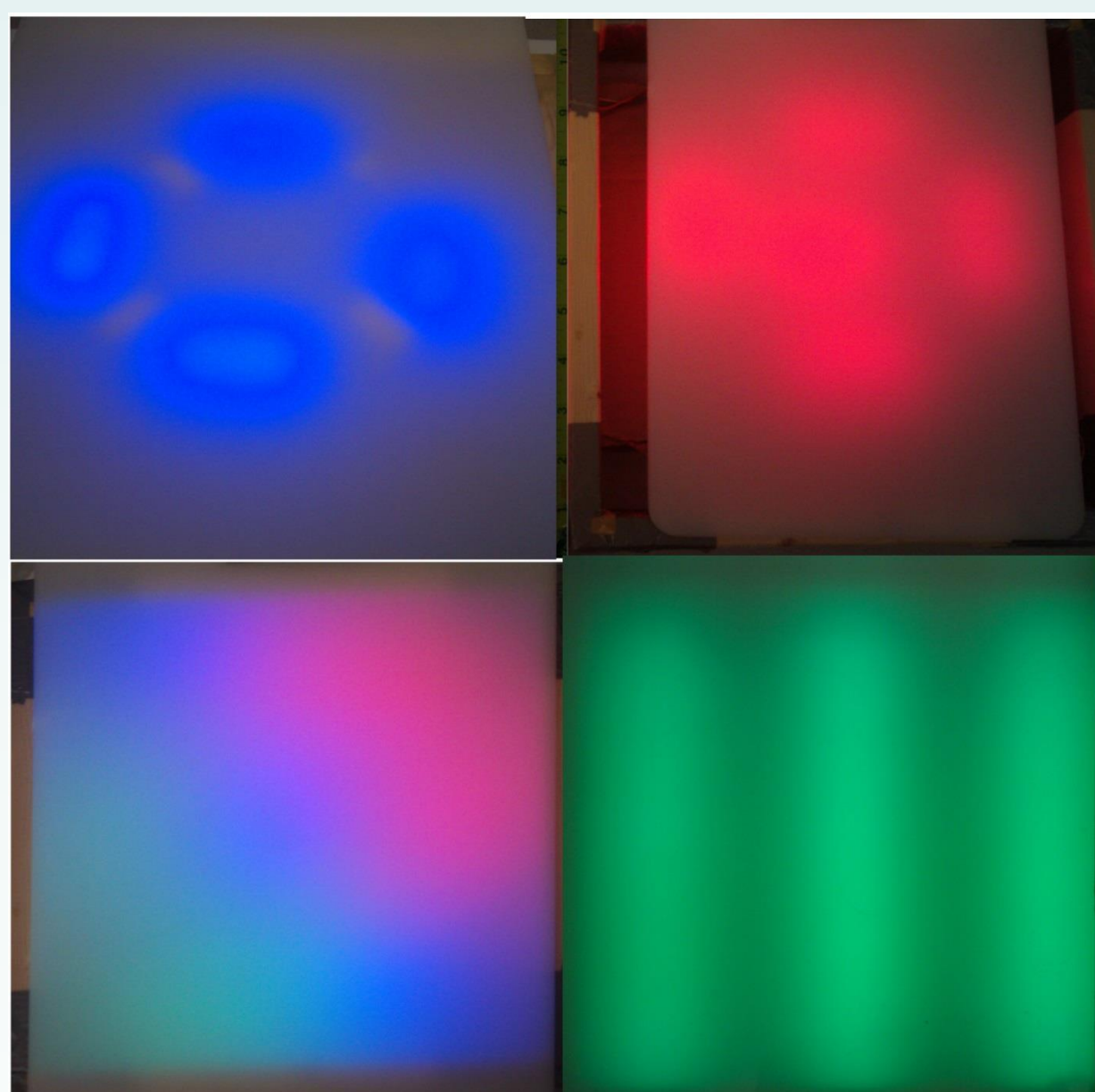
Floor Mosaic Design

The 13'x9' floor display is broken up into three separate modules.

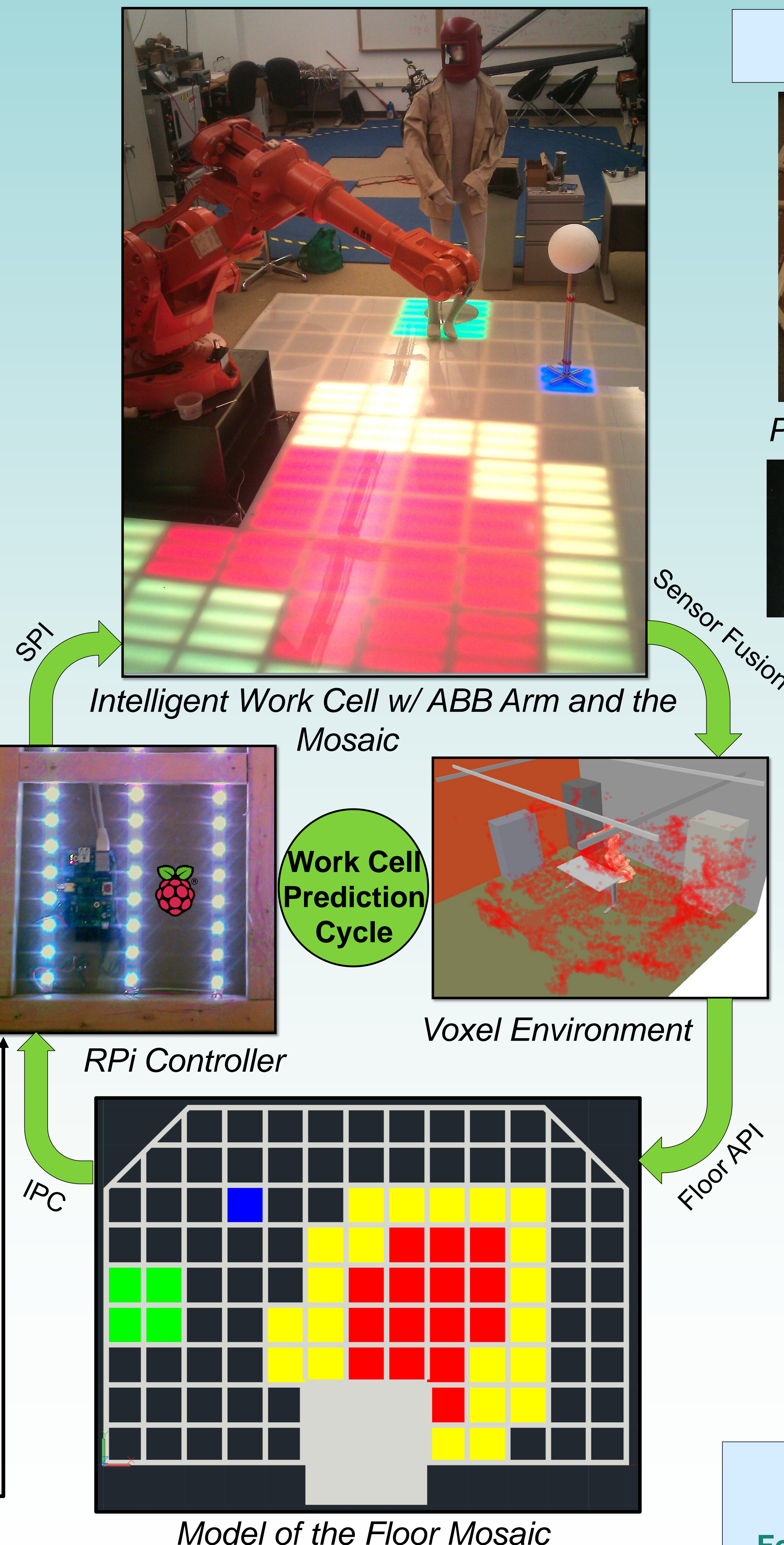


AutoCAD Model

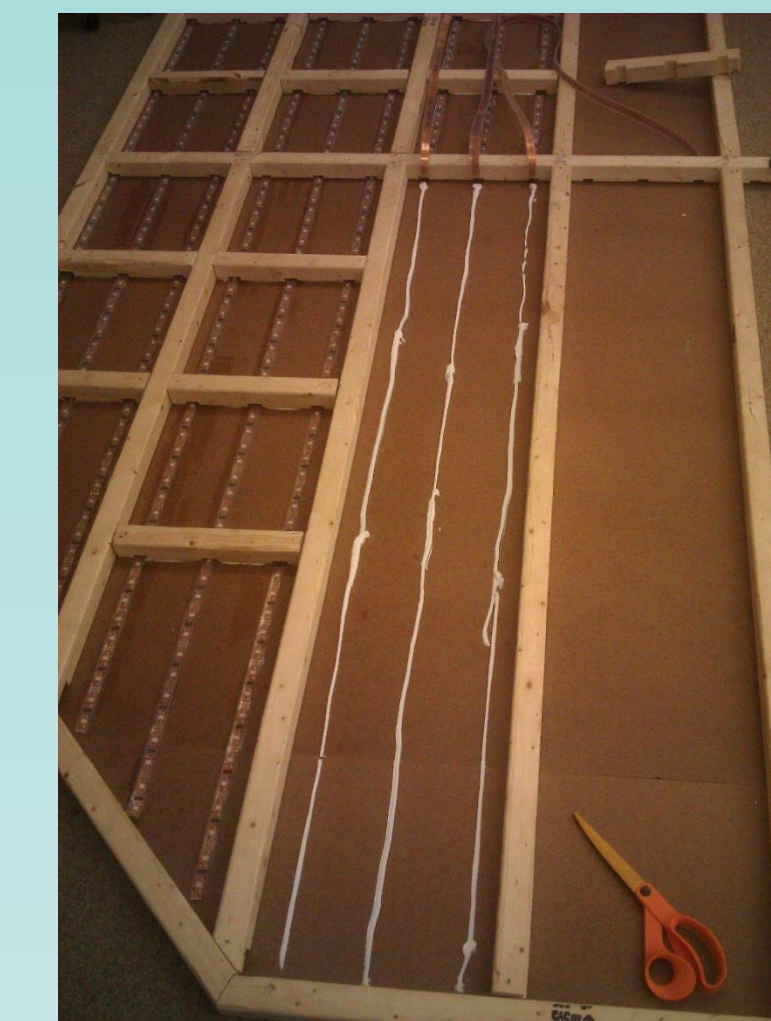
The floor utilizes strip lights running parallel to the main supports. The top Polypropylene layer was selected for diffusive nature and strength. Later design variables included height of support beams, placements of lights and methods of wiring.



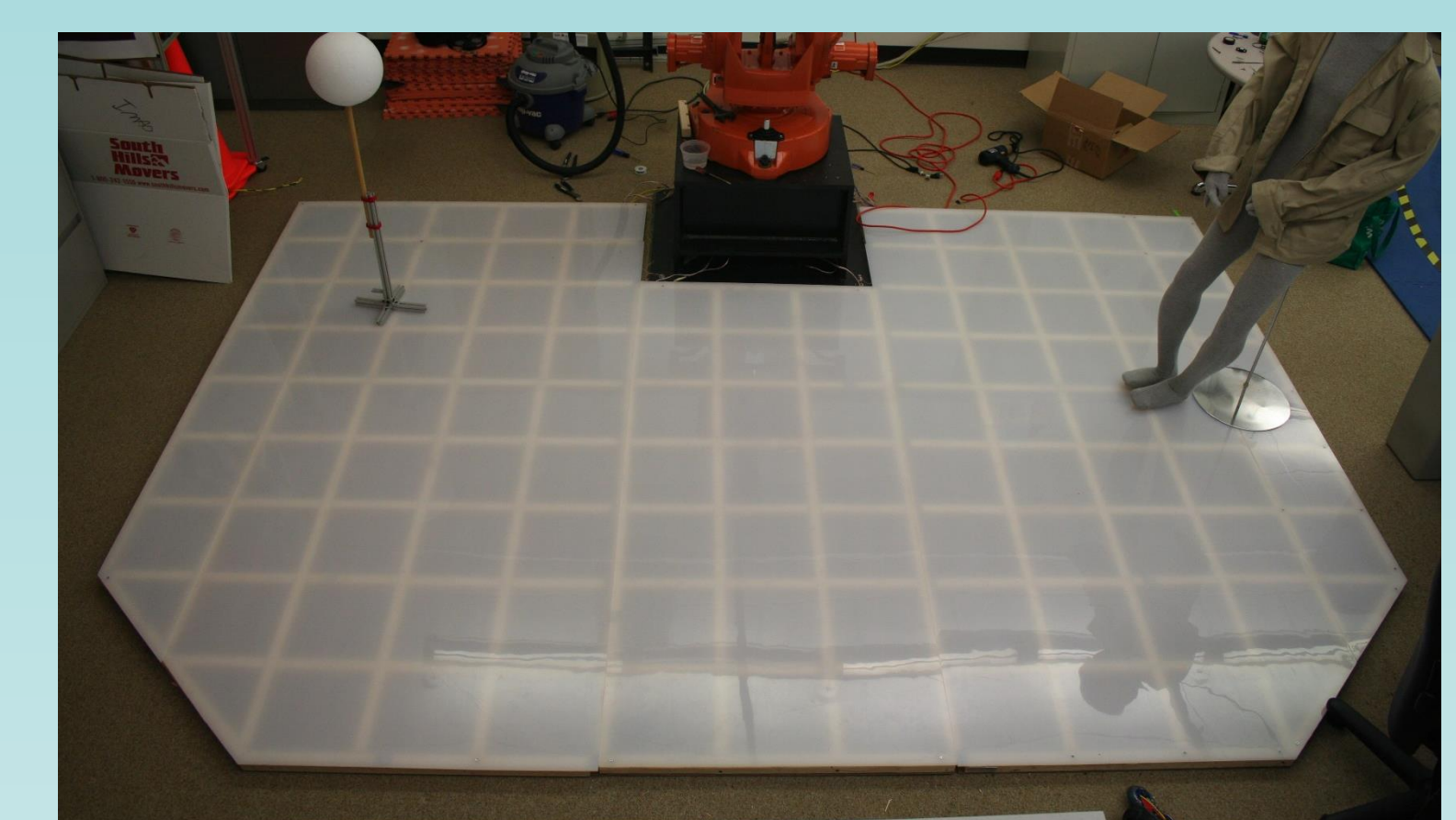
Tested Light Configurations



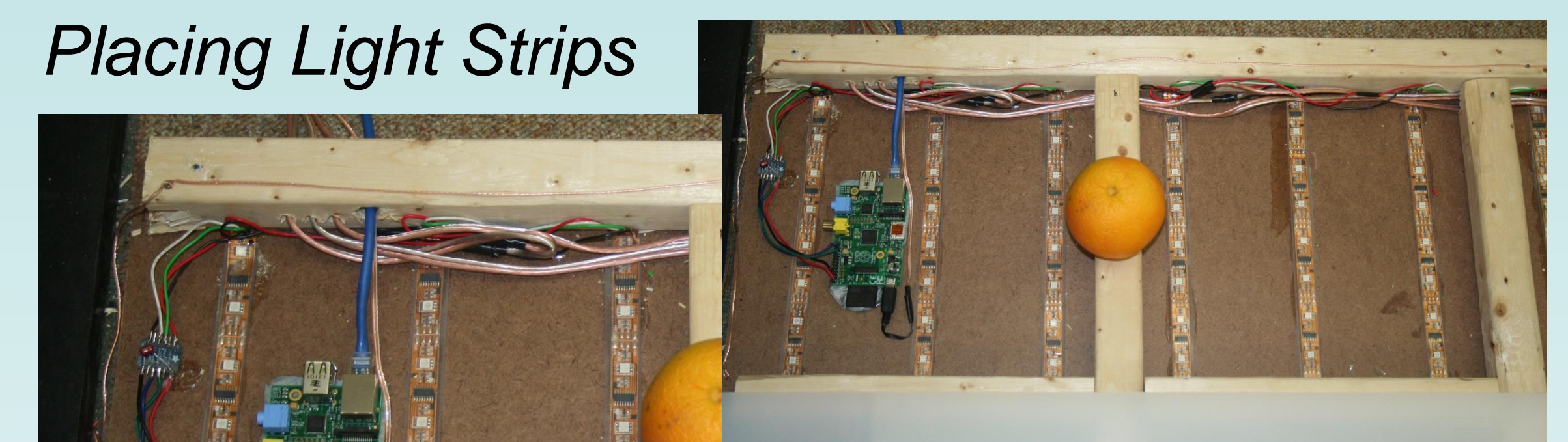
Construction



Placing Light Strips

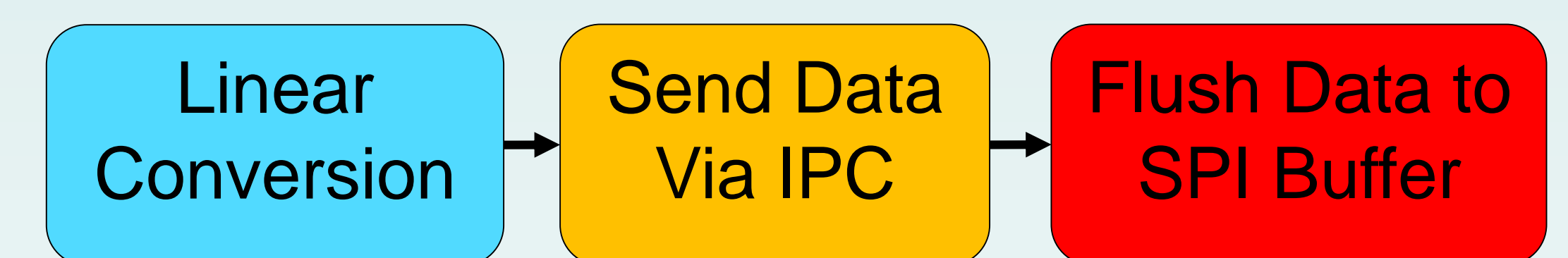


Completed Floor



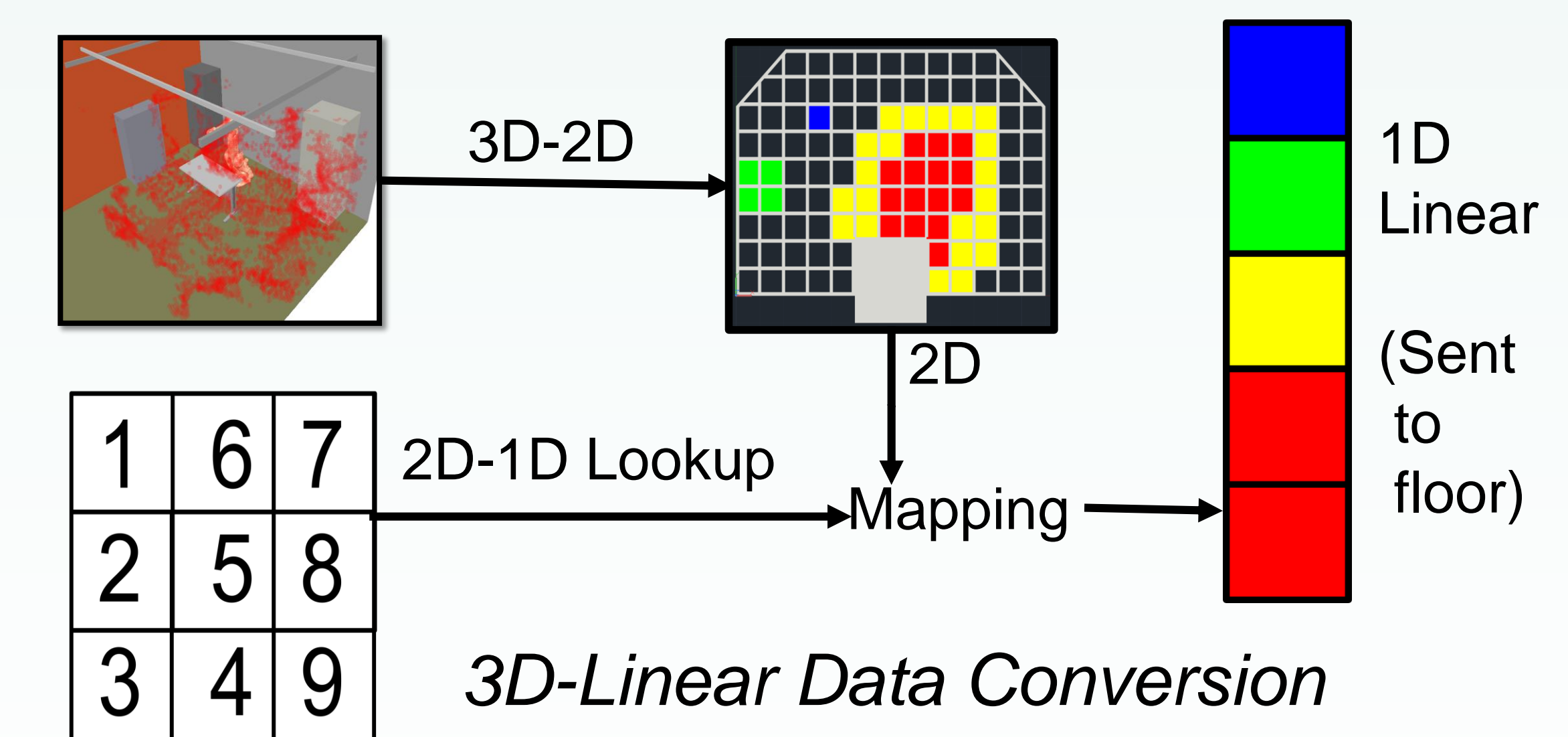
Lights and Wiring (Left is zoom)

Floor Mapping Software



Main Code Sequence

The system uses Inter Process Communication (IPC) to transfer information. The three Raspberry Pi's control each of the independent floor modules.



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Dr. Daniel Huber and Dr. Reid Simmons,
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