From Students…
…to Professionals

Project Plan
Computer Vision for Furniture Manufacturing

The Capstone Experience

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Functional Specifications

• Automates verification process after fabrics are glued on to panels
• Assists human inspection
Design Specifications

• Raspberry Pi on assembly line
  ▪ Scans barcode
  ▪ Takes image
  ▪ Uploads image to AWS for classification

• AWS
  ▪ Sends classification scores to interface

• Web interface
  ▪ Displays verification results
Screen Mockup: Correctly Classified

Barcode Image
Fabric ID: 0187H

Camera Image
Confidence: 99%

Predicted Image
Fabric ID: 0187H
Screen Mockup: Incorrect Label

Barcode Image
Fabric ID: 0187H

Camera Image
Confidence: 99%

Predicted Image
Fabric ID: 0187B
Screen Mockup: Low Confidence

Barcode Image
Fabric ID: 0187H

Camera Image
Confidence: 80%

Predicted Image
Fabric ID: 0187B
Screen Mockup: Correctly Classified

Barcode Image
Fabric ID: 1H021

Camera Image
Confidence: 98%

Predicted Image
Fabric ID: 1H021
System Architecture
Technical Specifications

• Raspberry Pi
• AWS
• SQL
• Python
• TensorFlow
• Flask
System Components

• Hardware Platforms
  ▪ Raspberry Pi
  ▪ Raspberry Pi Camera Module
  ▪ Barcode Scanner

• Software Platforms / Technologies
  ▪ Git
  ▪ AWS
  ▪ SQL Management Studio
  ▪ Flask
Risks

• Lighting
  ▪ Risk: Moderate
  ▪ Difficulty: Moderate
  ▪ Getting lighting consistent on factory images to correctly detect color
  ▪ Research lights for computer vision system and purchase it

• AWS
  ▪ Risk: Moderate
  ▪ Difficulty: Moderate
  ▪ We do not have adequate AWS knowledge
  ▪ Learn AWS tools and services, like SageMaker, Lambda, and API Gateway

• Verification Speed
  ▪ Risk: Low
  ▪ Difficulty: Low
  ▪ How long a fabric image takes to get classified
  ▪ Optimize machine learning model
Questions?