Project synopsis:

Short Title: VR360Semi
Title: Interactive 360 Video-based Training with VR for Semiconductor Manufacturing
Project lead and contact details: Eoghan Cowley, cowley@mines.edu
Suggested team size: 3-4
Logistics: On-campus

Project description:

Tutorial-style videos are commonly used to train the workforce for semiconductor manufacturing. However, since traditional video-based tutorials could only convey a pre-scripted and uni-faceted knowledge of one component at a time, they often fail to deliver the learner a comprehensive understanding of the complex and multi-state nature of the tools and equipment in the cleanroom. To solve this, we created an object detection model to identify manufacturing equipment in a video and provide the user with extra information on those machines detected. This model is currently used in conjunction with traditional interactive video player, now we want to integrate it into a 360 video and a VR headset such as the Quest 2/3. The components detected in the video will be high-lighted via a 3D overlay, and the interaction (e.g., clicking, panning and zooming) with the components in the video will be enabled through the VR hand controllers, head movements or a virtual pointing device.

Project components:

- Building a VR application capable of:
    - Playing 360 video
    - Providing the user with a 3D overlay of detected objects
    - Detecting user interaction with controllers or hands
    - Displaying information panels on those objects when interacted with.
- Further training of the object detection model

Desired skills:

Following skills are essential but not necessarily required:

- Familiarity with VR platform development
- Familiarity with game engines such as Unity
- Familiarity with Object Detection models

Devices available:

- Quest 2/3

Expected Outcome:

At the end of the project, the team is expected to make a demo showing a VR application with a user interactable interface.