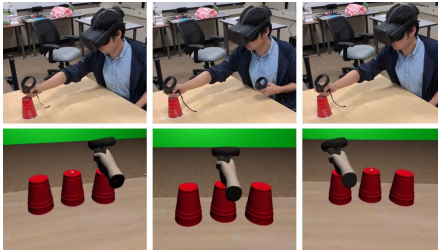# CS 490/590 Introduction to Virtual Reality and Augmented Reality

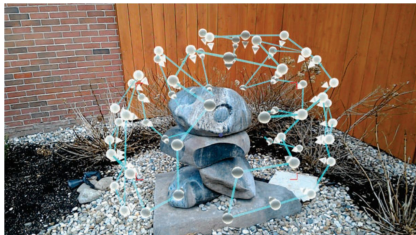When: Spring 2020, Instructor: Voicu Popescu, popescu@purdue.edu

Sample projects:

Passive haptics: manipulate real to virtual mapping to make user reach for same prop

VR roller coaster: three degree-of-freedom interactive immersive viewing of 360 video

AR guidance for scene acquisition

Video-see-through AR displays: simulated transparency

Prerequisite: Programming in C, e.g. CS 240

Overview: an introduction to Virtual Reality (VR) and Augmented Reality (AR), from foundations, to implementation, to open research problems.

Syllabus:
- Background: brief tutorials on linear algebra, geometry, coordinate systems, transformations, cameras, rendering, shaders, C# programming.
- VR: head mounted displays, tracking, redirected walking, 360 videos, haptics, collaboration, gaze tracking, foveated rendering, applications.
- AR: optical & video see-through displays, annotation anchoring, diminished reality, apps.
- VR and AR user studies: design, implementation, analysis, task load and cybersickness.

Project HW & SW: Oculus Quest, MS HoloLens, Android tablets, Unity, ARCore.

Grading: 4 projects x 12% + 1 midterm x 25% + 1 final project x 22% + attendance 5%.

Seats available: 15 undergraduates + 10 graduates; fill out Qualtrics if you're interested: https://purdue.ca1.qualtrics.com/jfe/form/SV_6sYyKD1zlM2EUdL.

Callout: For more info, demos, and pizza, come out on Wednesday November 6, from 6:00p to 8:00p, in the Lawson Commons (i.e. Lawson atrium, i.e. LWSN 1130).