Link Lab Reception and Demo Night
November 6, 2024

[1] Behind the Scenes with the Cavalier Autonomous Racing Team - Have you ever wondered how the Cavalier Autonomous Racing Team perfects their software during the off-season? Step right up and dive deep into our high-fidelity hardware-in-the-loop simulation environment. This is where we run the exact same code on the same computer that's installed in our real racecar. Discover how simulation helps us iron out all the kinks and refine our code to perfection before it ever gets to power the real deal. Your pit stop to understanding the future of autonomous racing is here!

[2] AI Autonomous Racing Simulator - Ever dreamed of burning rubber on a Formula One racetrack? Now's your chance! Hop into the driver's seat and pit yourself against our state-of-the-art DeepRacing AI, as it flawlessly clocks a competitive time on the racetrack. Do you have what it takes to outpace our AI driver? Rev up your engines and let's find out! Let the thrill of speed and the challenge of outsmarting AI ignite your passion.

[3] ORCL Bicycle Simulator - The Omni-Reality and Cognition Lab (ORCL) is a state-of-the-art virtual reality lab utilizing technology to research human behavior and reaction to virtual environments. This virtual reality simulation demo is one of the tools for understanding road user preference and reaction.

[4] Smart Cities Sensors – This demo presents sensors and data acquisition devices can be installed on the roadside to monitor the pavement status, i.e., vibration, subsurface temperatures, and soil water content. You can see how such a sensing system is deployed in the field and also play with sensors, data loggers, and computer code to control the measurements, visualization, and storage of data.

[5] Wearable Exoskeleton – This prototype represents a new, flexible upper body exoskeleton designed as assistive technology for individuals with neuromuscular diseases such as cerebral palsy or for those with motor control loss. The goal of this device is to help users perform activities of daily living, such as lifting a heavy cup of water. This research includes an interdisciplinary approach integrating engineering innovation with human health and behavior. The lab mainly focuses on wearable sensors, soft robotics, biomechanics and exploring the use of conductive textiles and soft materials to achieve different results, such as embroidered circuits, soft actuators, and heat sensors.

[6] Living Link Lab Testbed – We showcase visualizations of data from various IoT devices deployed in the Link Lab. We highlight how IoT deployments can support Edge Computing by utilizing cheap, available, and underutilized compute of IoT gateways. We showcase how our distributed middleware enables developers to build edge computing applications which can operate on IoT data streams.

[7] DJI Mavic - The DJI Mavic drone is equipped with a variety of high-performance sensors, are lightweight and portable, and are resistant to the effects of weather. Such sensors are useful in autonomous inspection and aerial photography.

[8] Robot Dog - Spot is a quadruped robot from Boston Dynamics. It is very useful for navigation through environments that have been traditionally challenging for robots, such as climbing up and down stairs. We are programming Spot to safely and autonomously navigate cluttered and occluded environments.

[9] NAO Robot - Humanoid robots provide a unique opportunity for personalized interaction using emotion recognition. However, emotion recognition performed by humanoid robots in complex social interactions is limited in the flexibility of interaction. We explore the abilities of Nao humanoid robots to adapt to users through emotion recognition and adapt through a combination of gestures, sound effects and verbal communication.

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Arena

Entrance

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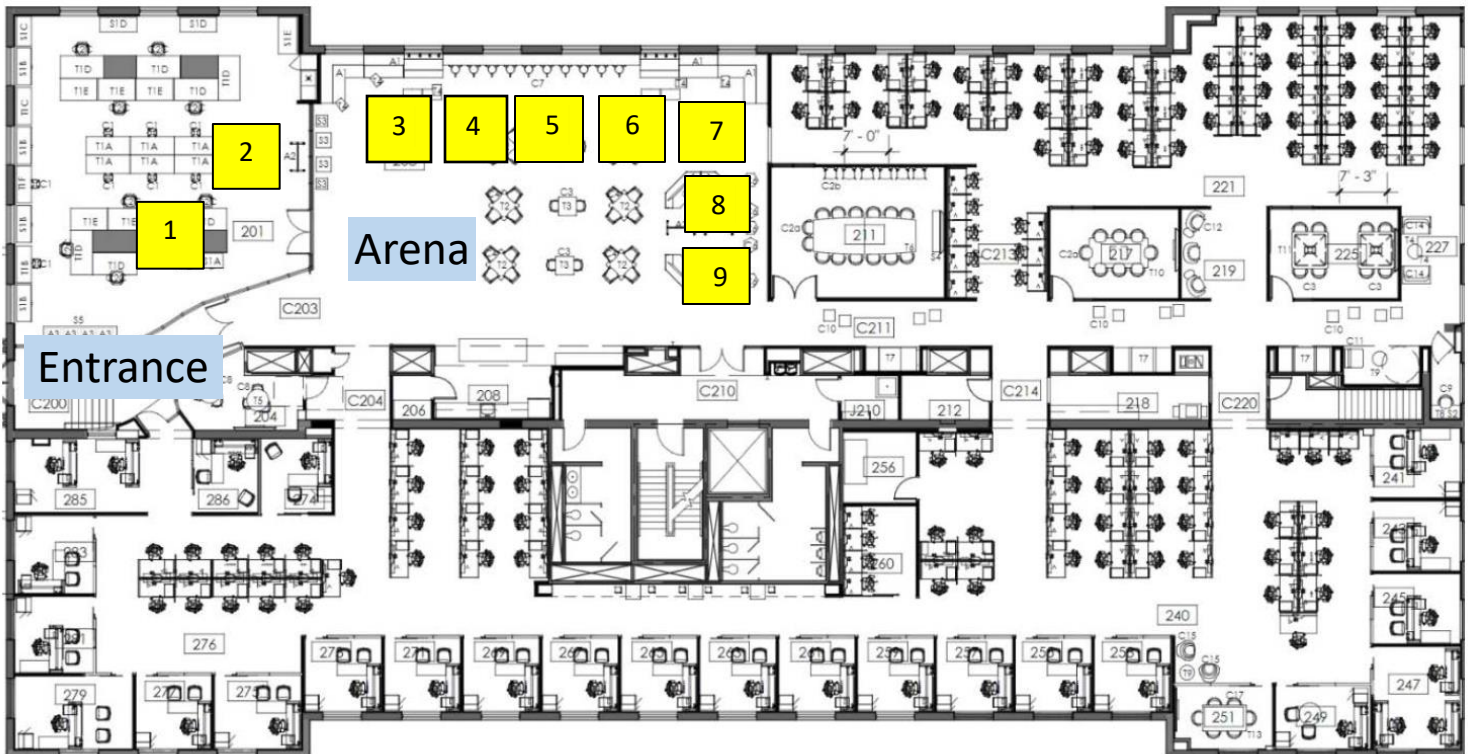
[1] Behind the Scenes with the Cavalier Autonomous Racing Team *(Trent Weiss, Amar Kulkarni)*

[2] AI Autonomous Racing Simulator *(Trent Weiss, Amar Kulkarni)*

[3] Virtual Reality Bike Simulator *(Arman Hosseini Aliabad)*

[4] Smart Cities Sensors *(Muchun Liu, Hossein Tavakoli)*

[5] Wearable Exoskeleton *(Nazirah Farach Rojo)*

[6] Living Link Lab Testbed *(Beatrice Li, Hamid Reza Roodabeh)*

[7] DJI Mavic *(Nick Mohammad, Jonathan Reasoner, Woosung Kim)*

[8] Robot Dog *(Nick Mohammad, Jonathan Reasoner, Woosung Kim)*

[9] NAO Robot *(Sujan Sarker)*