CYPHER

Cyber-Physical Intelligence and Security

NEWSLETTER

· FALL 2021 ·

Welcome to the Fall 2021 semester

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THE UNIVERSITY OF RHODE ISLAND
COLLEGE OF ENGINEERING

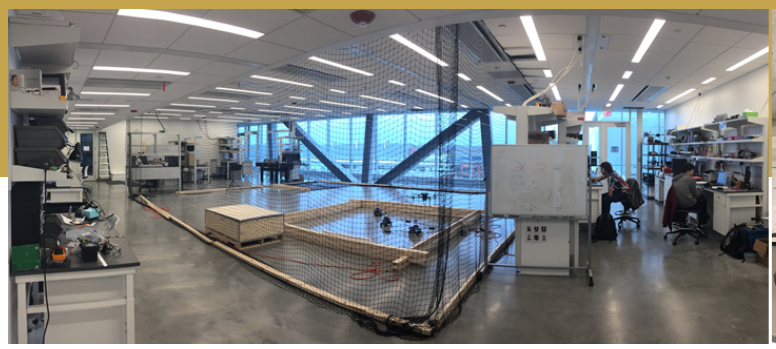
CYPHER
Cyber-Physical Intelligence and Security

RECENT NEWS

DR. STEGAGNO AND STUDENT ARE FINALIST FOR "BEST STUDENT PAPER AWARD"

Paolo Stegagno, Assistant Professor in the Electrical Engineering department, and his graduate student, Thivanka Perera, attended the 15th International Symposium on Distributed Autonomous Robotic Systems. This event was also in combination with the 4th International Symposium on Swarm Behavior and Bio-Inspired Robots. These events were originally supposed to be held in Kyoto, Japan but it was moved online from June 1st through June 4th.

Their research paper titled “A PHD Based Localization System for Robotics Swarms” was selected as “Best Student Paper Award Finalist”.



Pictured above: The Intelligent Control and Robotics (ICRobots) Lab which is co-directed by Professors Chengzhi Yuan and Paolo Stegagno.

Pictured left: The robots used in the lab with the award certificate from the symposium.

$1.2M NSF GRANT TO IMPACT VARIOUS INDUSTRIES

Professor Qing Yang and Tao Wei were awarded $1.2 million dollars to design and develop novel computer hardware for artificial intelligence, as well as smart sensing with capabilities for high-performance and energy-efficient computing.

This project proposes a new architecture, PARIS (Phased Array Radar with In-Sensor Computing), that simultaneously senses and processes 3D images in real time. The new architecture mimics the human visual system, which not only detects and senses 3-D visual images but also performs first-stage image processing before the more complex processing in the visual cortex of the brain.

Once completed, it will be the first in-sensor computing architecture leveraging a phased-array radar system for an energy-efficient, high-performance, low-cost, and compact sensing/computing platform. By combining phased-array radar imaging and neuromorphic computing, PARIS opens up a new avenue for research in in-sensor computing and intelligent image processing.

The project has transformative impact on a wide range of industries including medical instruments, autonomous vehicles, machine vision, robotic control, IoT devices, smartphones, and consumer electronics. Research activities of the project are involving female and minority students, strengthening the PIs' current K-12 outreach activities, and enhancing grand-challenge courses for all majors at the university.

NSF

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STUDENT SPOTLIGHT

UNDERGRADUTE SUMMER RESEARCH INTERNS

During the summer of 2021, 20 undergraduate students conducted research with CYPHER faculty members. Listed below are a few of those students.

Nicholas Clavette

Nicholas researched Reinforcement Learning (RL), a sub-field of AI that investigates how agents can maximize cumulative reward received by taking profitable actions to traverse the states of an environment. Clavette learned many fundamentals of single agent RL during his internship. He will continue his research in the CISA Lab while perusing a two year M.S. degree in Electrical Engineering.

Zachary deWardener

Zachary is an Industrial Engineering major within the 2021 URI Energy Fellow program. He worked in Dr. He and Dr. Sun's research lab where his research was focused on the project's SCADA (Supervisory Control and Data Acquisition) which acts as the "control center" for the digital twin of the electrical grid. He was tasked with creating a visually appealing HMI (Human Machine Interface) that would be able to show the grid's status from a single monitor. More recently he's been researching different coding languages with the goal of being able to control and change components of our digital twin through Python script.

Jessica Yang

As a rising junior majoring in Electrical Engineering and minoring in Mathematics, Jessica worked at the NEXT Lab under Dr. Wei where she learned about SoC (system on chip) and FPGAs (field programmable gate arrays) and their various applications.