UNF's Machine Vision Laboratory: Year One Synopsis (2018)

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Summary

The UNF Machine Vision (MaVis) Laboratory for hands-on teaching and student-engaged research is co-led by Dr. Ayan Dutta (Assistant Professor, School of Computing) and Dr. Patrick Kreidl (Associate Professor, Electrical Engineering) under advice of Mr. Daniel Preza (Staff Engineer, Johnson & Johnson and Adjunct Professor, Electrical Engineering). This cross-school endeavor initiated in January 2018 with equipment (valued at over $100,000) provided through the generosity of *Cognex Corporation* and *ICS, Inc*. This summary (i) highlights the lab's year one accomplishments, (ii) describes plans for the coming year and (iii) identifies related educational and research activities underway at UNF that the MaVis Lab seeks to complement in the future.

With ten cameras resourced by Cognex (each valued at approximately $9000) and three vision assembly stations for the cameras resourced by ICS (each valued at approximately $1600) stations include all the necessary cables, lenses and lighting so students can be presented with image acquisition and analysis challenges representative of those encountered in practical applications.

Year One Accomplishments

- Spring 2018 -- Integration of new equipment with Preza's second teaching of *EEL4931 Industrial Machine Vision*, improving the student satisfaction rating (on a 5-point scale) to 5.00 from eight students (up from 4.67 in its first teaching in Spring 2017 to nine students).
- Fall 2018 – Initiation of new UNF-funded research collaboration between Dutta and Kreidl on "Agricultural Information Collection Using a Team of Autonomous Drones," which includes student assistants for the sub-problem of multi-spectral image processing and, in turn, a vehicle by which to attract research-minded students to join the MaVis Lab.

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Plans for Coming Year

- Spring 2019 – Preza's third teaching of *EEL4931 Industrial Machine Vision* will also be offered to computing students, in addition to electrical and mechanical engineering students as in past teachings.

- Fall 2019 – An "Industrial Machine Vision" demo as part of the College of Computing, Engineering and Construction (CCEC) Jumpstart Program, a three-day pre-cursor to the university-wide orientation events for incoming Freshmen who have indicated a CCEC program as their major course of study.

Related Educational and Research Activities

- UNF's School of Engineering is anticipating a new Bachelor of Science program in Manufacturing Engineering, whose students are likely to be interested in our hands-on Machine Vision course as a technical elective.

- UNF's School of Computing is anticipating a designation as a DHS/NIST Cybersecurity Center of Excellence, searching for three new Assistant Professors and creating potential for new faculty interest into our equipment as a platform for industrial control security education.

- UNF's Material Science and Engineering Research Facility (MSERF), funded by the Florida state legislature under the Advanced Manufacturing and Materials Innovation (AMMI) initiative, is similarly dedicated to image understanding in support of industrial R&D, process control and quality assurance – the MaVis Lab focuses on image understanding at the macroscopic level while MSERF focuses on image understanding at the microscopic level.