numurus
SMART SYSTEM SOLUTIONS

Numurus Supports Drone Automation with Turnkey AI and Automation Solutions

THE PROJECT

Christopher Catalanotto, a Lane Community College Aviation Unmanned Aircraft System (UAS) program student is developing and deploying autonomous drone search and rescue capabilities for his senior capstone project. The new capabilities include adding human and car AI detection, real-time imagery analysis, autonomous drone flight path tasking, and near real-time critical information distribution to remote emergency responders - all occurring autonomously onboard the drone without human intervention.

Lane Community College℠

>>> THE CHALLENGE

Adding advanced AI and automation to a drone and other robotic platforms requires the integration and orchestration of a variety of technologies even before Christopher can work on the specific AI and automation solutions they envision. Not only is this integration work complex and intensive, but it also requires extensive low-level software development that distracts from the ultimate education goals. Also, the integration work is typically well outside the capabilities of typical STEM student capabilities and can add months of tedious low-level coding. Within the confines of a 4-month capstone project, this is nearly impossible to accomplish even if the student has the technical capabilities to do so.
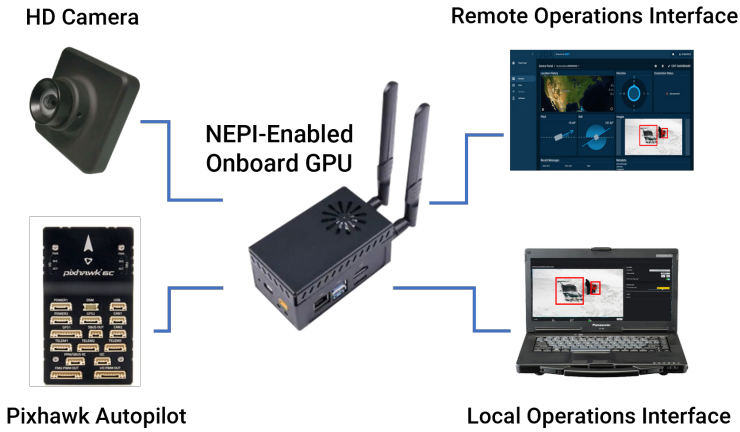
>>> THE SOLUTION

Numurus' turnkey edge-compute hardware pre-installed with its NEPI AI and automation software provided a complete development environment allowing the students and educators to rapidly integrate AI and automation into their projects. With plug-and-play sensor and drone interface drivers, built-in AI and automation applications, and browser-based user interfaces, NEPI provided a low-code environment that together saved students months of learning and coding low-level software, allowing them to jump right into their AI and automation development and testing.

SOLOMON SINGER, UAS INSTRUCTOR, LANE COMMUNITY COLLEGE

"With Numurus' NEPI operating system and turnkey hardware solutions, our students don't need to be computer scientists to learn and apply the latest in AI and automation technologies. Following our current partnership supporting student capstone drone automation projects, we intend to collaborate with Numurus and build an AI and automation curriculum augmented with their NEPI edge-compute hardware and open-source operating system."

NEPI-ENABLED DRONE AUTOMATION SOLUTION

HD Camera

Remote Operations Interface

NEPI-Enabled
Onboard GPU

Pixhawk Autopilot

Local Operations Interface

>>> THE PROCESS

Leveraging a NEPI-enabled drone automation hardware solution, Christopher will orchestrate drone autonomous actions using NEPI deployed Python- scripts and the NEPI ROS API. For this project, Christopher will rapidly achieve his proposed autonomous drone search and rescue solution by executing the following three NEPI configuration steps:

1) Enable the common object detection AI model that ships standard with NEPI.

2) Write a NEPI automation script that looks for specific features such as color combinations in human and vehicle AI detection boxes, then automatically sends those images and geolocations to a remote search and rescue operations portal.

3) Test and iterate as required.

THE FUTURE

Building on the initial capstone project support, Numurus plans to work with Lane Community College instructors to develop a drone AI and automation curriculum suitable for their drone students and STEM programs around the world. The envisioned program will teach students the fundamentals of using and applying AI and automation to real world drone operations. The curriculum will also include data labeling and AI model training to prepare students for the next generation of smart drone applications.