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Mobile Device Enabled Robotic System

A low-cost, highly efficient commercial UAV system uses readily available mobile devices and intelligent software for autonomous navigation and robotic social networking, expanding commercial applications beyond traditional remote control and high costs.

Using new technologies to improve the commercial market is an ongoing process. Currently, unmanned aerial vehicles (UAVs) and drones are used for military applications and their adoption and availability in commercial and civilian areas are stalled by their high cost and limited functionalities. Some sectors that are employing this technology to make it more commercial, include aerial video photography, toy/hobby, and monitoring/surveillance; however, they are limited to remote control by humans, having simple point-to-point navigation and high cost.

To solve this issue and expand the use of UAVs/drones commercially, researchers from Purdue University have developed a low-cost UAV equipped with sensor modules and readily available mobile devices, such as smartphones or tablets, which run intelligent software for autonomous navigation, onboard computer vision, communication, and robotic social networks. This software is responsible for high layer work, which includes switching between behaviors, such as robotic social networking and artificial intelligent planning; a middle layer generates a path and avoids obstacles between waypoints; and a low layer path-tracking feedback controller.

Since this technology uses a mobile device and software, it is highly efficient due to its low cost, hardware, and connectivity. In addition, other supporting resources, such as cellular foundations and GPS satellites, are readily available for UAVs. This highly practical and efficient commercial UAV system can increase the connectivity between robots and humans.

Advantages:

-Uses a mobile device

-Lower cost of hardware and connectivity

-Commercial use of UAVs and drones

Technology ID

2015-DENG-67038

Category

Artificial Intelligence & Machine Learning/Computer Vision & Image Recognition

Aerospace & Defense/Autonomous Systems (UAVs & AVs)

Robotics & Automation/Autonomous Systems & Perception AI

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Potential Applications:

-Endless commercial applications

-Consumers

TRL: 5

Intellectual Property:

Provisional-Patent, 2014-11-27, United States | Utility Patent, 2015-11-25, United States | CON-Patent, 2018-04-12, United States

Keywords: unmanned aerial vehicles, UAVs, drones, commercial applications, low-cost UAV, autonomous navigation, onboard computer vision, robotic social networks, intelligent software, mobile device UAV system