THE DEVELOPMENT OF MULTI-ROTOR UNMANNED AERIAL VEHICLE

Jie-Tong Zou, Chien-Yueh Hsu, Rui-Feng Zheng
Department of Aeronautical Engineering, National Formosa University, Huwei Township, Yunlin County 632, Taiwan

ABSTRACT: Unmanned aerial vehicle (UAV) had been developed for many years, and the multi-rotor vertical take-off and landing (VTOL) unmanned aerial vehicle, which can fly stability and hover in the fix position, was developed fastest. The multi-rotor unmanned aerial vehicle has many advantages: simple mechanism, safer than helicopter, VTOL ability, small size and agile maneuverability. These multi-copters have many applications and can be flown indoors and outdoors.

In this research, we had developed asymmetric quadcopter (Flying bat) and hexacopter (Flyduspider), which had the following advantages: easily identified heading angle and larger payload ability. The dynamic model of quadcopter had been investigated in this research. During the developing process, we made many simulations and experiments for choosing suitable motor and propeller. These results can help us to design and build high efficiency, energy-saving, and long endurance multi-rotor aerial vehicle.

After building the hexacopter , we started to proceed a series of functional tests, for example: altitude hold flight, hovering (Loiter) , return to launch, and autopilot ...etc.

Keywords: unmanned aerial vehicle (UAV), multi-rotor, quadcopter, hexacopter, VTOL.