IOSR Journal of Engineering (IOSRJEN) **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
PP 53-57

Drone an Unmanned Aerial Vehicle

Prof. SuchetaRaut, Lina Bajirao , Prajakta Ninave, Shruti Fale
Department of Electronic and telecommunication Engineering Guru Nanak Institute of Engineering andTechnology,Dahegaon Nagpur, Maharastra,India
Department of Electronic and telecommunication EngineeringGuru Nanak Institute of Engineering and Technology,Dahegaon Nagpur, Maharastra,India

Abstract— *This paper presents usage of Unmanned Aerial Vehicle (UAV) as a valuable source for research and education purposes that could solve many aspects of inspection, surveillance, mapping, 3D modelling and various other data acquisition applications. An educational and technology transfer workshop was organized by Abu Dhabi Systems and Information Centre (ADSIC) and trained by ESRI to educate United Arab Emirates University geography students on using new software's and technology such as ArcGIS Pro, ArcGIS Online, ArcGIS Earth, tools such as Collector, Survey 123 and capturing drone imageries. The paper reports a typical photogrammetric workflow, 3D results like surface or terrain models, vector information, textured 3D models for United Arab Emirates University buildings. A unique understanding was developed within the participants for flight planning and its execution for generating 3D point cloud from drone imageries. Participants also learned about sharing the final products to other users and visualizing them using web and desktop client. The new technological innovation and advancements taught to the students is a part of larger project of 3D modelling for entire United The result and knowledge gathered through this particular training is useful for young students and future practitioners in need for successfully adaptingUAV technology for their applications in various field of work. Particularly, the students learned highly needed values in a knowledge based-economy such team-work, collaboration, creativity and critical thinking.*

Keywords *— Unmanned Aerial Vehicle (UAV), ArcGIS Pro, ArcGIS Online, ArcGIS Earth, United Arab Emirates University, Photogrammetric workflow,*

I. Introduction

Many studies have shown the influence of innovative practical teaching approach in produce-learn-research network. Knowledge network among various entities affects both regional innovation ability and its competitiveness, so they have attracted much

attention nowadays (Pond et. al., 2004). From the perspective of knowledge network, the factors that affect universityknowledge innovation ability are: inter-organizational network capitals, social capitals, the nature of knowledge flow, embeddability relations, inter-organizational learning (Huggins et. al., 2012).Academic capitalization is a driving force for science creation and presented by American entrepreneurial universities that transform original university-knowledge-innovation

achievements (Chen, 2015. The model followed in such situations, as the workshops mentioned in this research, is problem based learning, through projects, and their execution. Class and field based project learning allows students a much deeper knowledge and expertise through tackling real-world situational problems and challenges (John Psarras, 2006). It was the preferred method of

delivering knowledge for the mentioned project because it integrates actual knowledge, hands-on experience and developing expertise in the subject matter. Furthermore, such approach instil with the students in competencies needed for surviving in the modern era of knowledge based economies. Competencies such as team-work and collaboration are developed through the distribution of labour, creativity and critical thinking are developed through tackling real-world problems, and communication skills (Kozma, Robert B, 2005). Project management skills of organization, leadership and vision are instilled through the project –based learning model.

II. Literature Review

According to Heiser, the software that kept an unmanned Boeing Little Bird helicopter‟s computer secure was at the heart of its operating system, and it could be just what the world needs to make everything [6]. If hackers gain access to the kernel of any computer‟s operating system, then they can perform actions that are meant to be forbidden. In 2015, Heiser‟s team proved mathematically that their kernel, seL4, is unhackable. The kernel has a few highly secure properties: it can only do what it is designed to do; its code can‟t be changed without permission; and its memory and data transfers can‟t be read without permission. An earlier version of it, called OKL4, is now in millions of smart phones. Heiser says that two features underpin seL4‟s security, one of

which is a new way of isolating data inside the kernel. But the key development was making the code capable of being checked mathematically. Other kernels might have these properties too, but it is impossible to know for sure without mathematical proof [6]. The achievement of the „unhackable‟ system is a big deal for cybersecurity, but there are always ways to attack hardware, even if the software is impregnable. Hackers might be able to spoof a device‟s sensors or jam incoming communications or other signals, which could be just as devastating [7]. The aspiration to create formally verified software has existed nearly as long as the field of computer science. In October 1973, EdsgerDijkstra came up with an idea for creating error-free code.

III. Methods Andmethodology

As both the projects offered education and research using Drone technology, it was communicated in the workshop that a new model is adopted by the company called BCN Drone Centre for imagery acquisition and analysis. The Mikrokopter Flight Planning Tool (MK FPT) was used minimizes the manual effort and increases the accuracy. The parameters were given by the expert team considering theweight, volume, speed and torque of the UAV;. The pilot selected the Region of Interest on a map, final check of the camera resolution, flight altitude, speed, longitudinal and traversalcoverage of each photo. The flight planning software uses these parameters and compute the full flight plan consisting of waypoints that are the location points where the UAV takes photographs along its flight path automatically. As told by the instructors, up to 100 waypoints can be entered with little manual efforts.

A. Main controller

The an embedded computer (many run Linux) that has custom software for controlling the aircraft, sometimes user-reprogrammable through a software be thought of as the “brains” of the UAV. It is development kit (SDK). In some designs, the MC is a separate module with connection ports. On others, especially consumer products, there may be a single circuit board (PCB) that includes the MC, gyros/sensors, electronic speed controllers (ESCs), and other core flight electronicsheart of the flight-control system, this can.

B. Robocraze KK 2.1.5 Multi-rotor LCD Flight Control Board

It is a very popular flight controller as its cheap, works well, and does not need a PC to configure thanks to its built in LCD screen! This guide will provide links to the various manuals, and useful videos and links to help you get started with your KK2.1 flight controller.

C. Generic Portable Imax B3 AC 2S-3S 7-4V 11-1V Lithium Lipo RC Battery Balance Charger

Since all our quadcopters and fixed wing aircraft run on electric power, having a decent battery charger is very important to ensure your batteries last a long time and you get the most out of them. Its also important to have a quality charger from a safety point of view.

D. BRUSHLESS MOTOR

A brushless DC (BLDC) motor does away with the need for a mechanical commutator (moving part). Not having rotating mechanical components results more durable and reliable machine.

BLDC motors are generally smaller and considerably lighter than brush-types. This makes them especially useful in products that are tight for space and need to be lighter—like consumer drones.

Without getting too technical, brushless motor drones experience less wear and power loss. The initial cost of using a BLDC motors is higher, but the greater overall efficiency soon offsets this.

E. ELECTRONIC SPEED CONTROLLER

An electronic speed control or ESC is an electronic circuit that controls and regulates the speed of an electric motor. It may also provide reversing of the motor and dynamic braking. Miniature electronic speed controls are used in electrically powered radio controlled models. Full-size electric vehicles also have systems to control the speed of their drive motors. An electronic speed control follows a speed reference signal (derived from a throttle lever, joystick, or other manual input) and varies the switching rate of a network of field effect transistors (FETs) .[1] By adjusting the duty cycle or switching frequency of the transistors, the speed of the motor is changed. The rapid switching of the transistors is what causes the motor itself to emit its characteristic high-pitched whine, especially noticeable at lower speeds.

F. Propellers

Light UAVs use plastic propellers, which resist breaking on impact because they are flexible, and they are safer. Heavier models use carbon fiber or other more rigid materials (planes frequently use wood or nylon/glass). Carbon fiber propellers are dangerous, even deadly, and should be used only by experienced pilots and well away from people. Unless extreme performance is a concern, the benefits of carbon fiber over plastic are marginal on multi-rotors.

G. RECEIVER 6 CHANNEL

This receiver is for the radio control system. It pairs ("binds") with the controller the pilot or operator holds, which logically, if confusingly, is known as the "transmitter." Modern receivers typically operate in the 2.4GHz range (like other license-free radio systems, such as Wi-Fi) and have four or more channels, extra channels enabling custom functionality to be relayed via the control signal, in addition to basic piloting inputs. In the hobby world, these extra channels might be used for anything from retracting/extending landing gear to firing off a smoke generator. In aerial imaging applications, the extra channels can sometimes be dedicated to gimbal or camera control.

H. TRANSMITTER 6 CHANNEL

This is the radio controller. For an increasing number of tech toy and entry-level UAVs, the "transmitter" is simply the combination of a mobile app and a Wi-Fi-enabled tablet or smartphone Transmitters can range anywhere from simple two-joystick jobs for remote-control toys up to highly sophisticated pieces of electronics with advanced programming to support myriad aircraft configurations, expandable model memory, telemetry displays, audible feedback, and trainer ports. In many ways, high-end transmitters are more complex than aircraft they fly.

IV. Result

V. Conclusion

It is obvious that drone technology is an important part of the future of warfare and is set to become a big commercial industry. The fact that drones capabilities pose a threat to the liberties of people around the globe is also apparent. Legislating on drones now is of paramount importance because it sets the necessary limitations to protect

References

[1]. Bills, C., Yosinski, J. (2010). MAV stabilization using machine learning and onboard sensors.Technical Report CS6780, Cornell University.

[2]. Bills, C., Chen, J., Saxena, A. (2011). Autonomous MAV flight in indoor environments using single image perspective cues. In: IEEE Int. Conf. on Robotics and Automation.

[3]. Chen Xialing. Study on the organization innovation path of Entrepreneurial University [M]. Beijing: Beijing Institute of Technology press.2015:157