A Novel Method for Improvization of Video Capturing using Drone Technology in IoT

P.Deepika[1], Magesh G[2], Adharsh[3], Ashwin Akash[4]

Assistant Professor[1], UG Scholars[2 3 4], Dept. of Computer Science and Engineering, Rajalakshmi Institute of Technology

deepika.p@ritchennai.edu.in, adharsh.a.2014.cse@ritchennai.edu.in ashwinakash13@gmail.com magesh.g.2014@ritchennai.edu.in

Abstract: — **Drone technology based on IoT which actually explains about the characteristics of drones which are basically used for the transport, surveillance and even military based operations. The drone technology provides generic services for various drone applications, such as, sport fields, traffic surveillance, search and rescue, and more. Controlling of drones in a desired position and desired angle. The key components which consist of a manually controlled drone, sensors attached to the drone, camera which captures high quality accurate images on the move. Drone technology which helps in high area coverage, energy efficiency and fault tolerance.**
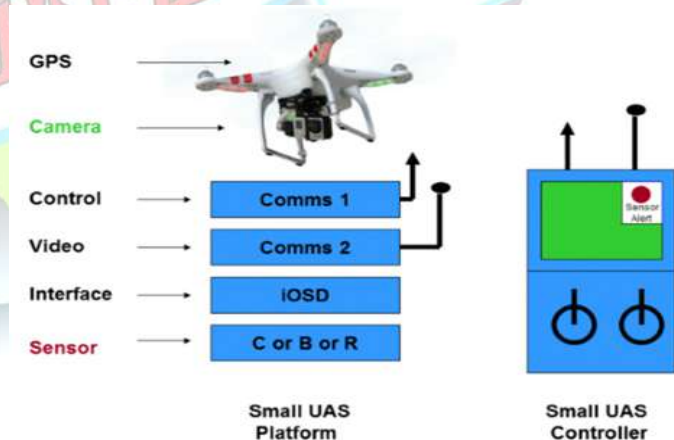
Keywords: IoT-internet of things.

I. INTRODUCTION

DRONE TECHNOLOGY BASED ON IoT WHICH ACTUALLY EXPLAINS ABOUT THE CHARACTERISTICS OF DRONES WHICH ARE BASICALLY USED FOR THE TRANSPORT, SURVEILLANCE AND EVEN MILITARY BASED OPERATIONS. THE DRONE TECHNOLOGY PROVIDES GENERIC SERVICES FOR VARIOUS DRONE APPLICATIONS, SUCH AS, SPORT FIELDS, TRAFFIC SURVEILLANCE, SEARCH AND RESCUE, AND MORE. CONTROLLING OF DRONES IN A DESIRED POSITION AND DESIRED ANGLE. THE KEY COMPONENTS WHICH CONSISTS OF A MANUALLY CONTROLLED DRONE, SENSORS ATTACHED TO THE DRONE, CAMERA WHICH CAPTURES HIGH QUALITY ACCURATE IMAGES ON THE MOVE. DRONE TECHNOLOGY WHICH HELPS IN HIGH AREA COVERAGE, ENERGY EFFICIENCY AND FAULT TOLERANCE.

rescue of the victims from an earthquake or any natural disaster occurred area, penetrating through the damaged buildings for the search of any survivors.

Small UAS Platform

Small UAS Controller

Availability:

Drones used for the cops in order to find the criminals hideouts inside a particular range at a specific radius. For the main purpose of aerial photography, cinematography and other entertainment purposes. Drones for the study of aeronautics and virtual gaming experience. Drones for the main feature of military grade systems for the detection of weapons in the enemy base with the help of magnetic frequency which is set in the drone to detect from a specific distance. The latest feature for the development in drone is the self-editing cameras which are used in the field of cinematography. Drones which are used in the field of

s.no	System	Application	Functions	Advantage	limitations
1.	Air traffic control system	traffic control, accident avoidance.	Traffic control mechanism.	Safety assurance for each individual vehicle.	Minimum chance of quality assurance.
2.	Surveillance broadcast on air traffic	Displaying of the traffic situation in the roads	Traffic control mechanism	Predictions can be made easily with high traffic situations.	Broadcast time is limited.
3.	Drone delivery system	Delivering of objects to the specified location	Delivery system	Accurate delivery of objects to destination address.	Area coverage is less.
4.	Miniature unmanned aircraft system	For the search of victims in the disaster striked areas	Emergency system	Reduction of the usage of manpower in the emergency sectors.	Time duration for image processing is high.
5.	Wireless power transfer system	Transferring of power through wireless system	Power transfer mechanism	Since the device is wireless the transfer of power is time convenient.	Lack or any cause may occur while wireless transition.
6.	Short boundary analysis	Representative of boundary values in a particular range	Equivalence partitioning theory	The accurate values which are determined in a particular area.	The boundary value cannot exceed assigned coordinates.
7.	Snickometer	Determines the shape of recorded soundwaves	Sound reorganization	Recording the soundwaves in a particular distance for present and future usages.	Undesirable sounds caught up through the devices are also recorded.
8.	Hot spot	Infrared imaging system	Analysis aid for television coverage	The contra-friction of the image found through local temperatures.	Appearance of any of the other two contra-friction collision in same area.
9.	Spider cam	Image and video capturing	360^0 coverage in sports fields	Covers large area of the field, provides full view.	Size and weight reduces the movement speed.
10.	Rotoscoping	Trace over frame-by-frame motion picture	Animated images	Providing realistic images for entertainment purpose.	Time inconvenience for generating images. 50

Literature survey:

1. Short Boundary Direction:

Yuan et al., and Liu et al., combine the threshold-based method with an SVM-based classifier. The SVM-based algorithms are widely used for shot boundary detection. Zhang et al., have successfully applied gray level histogram analysis for shot detection. Boreczky and Wilcox, apply hidden Markov (HMM) models with separate states to model shot cuts, fades, dissolves, pans, and zooms. Zhao et al., propose a best first model merging algorithm for scene segmentation. The algorithm takes each shot as a hidden state and loops upon the boundaries between consecutive shots by a left-right HMM. Kenichi et al, used color histogram of a shot as color information and discovered important intervals having several color change patterns by using the probability model. Tan and Lu, use the GMM to cluster video shots into scenes according to the features of individual. Ahmet et al., 2003, proposed dominant color region detection, shot boundary detection and shot classification algorithms that are robust to variations in the dominant color. Quenot et al., define the thresholds for cut transition detection, dissolve transition detection, and flash detection as the functions of two global thresholds that are obtained from a trade-off between recall and precision.[13]

2. Snickometer:

The Snickometer is often used in a slow motion television replay by the third umpire to determine if the cricket ball touched the cricket bat on the way through to the wicketkeeper. The commentators will listen and view the shape of the recorded soundwave. If there is a sound of leather on willow, which is usually a short sharp sound in synchrony with the ball passing the bat, then the ball has touched the bat. the main purpose is to find out the fatter waveform generated by the bat. A Snickometer, commonly known as Snicko, is used in televising cricket to graphically analyse sound and video, and show whether a fine noise, or snick, occurs as ball passes bat. It was invented by English computer scientist Allan Plaskett in the mid-1990s. Plaskett, brother of chess Grandmaster James Plaskett, also invented another device for aiding television commentary on cricket: Flightpath, and is the author of 'H-Trauma: The General Theory of Evil', a work in the field of psychoanalysis. The snickometer was introduced by Channel 4 in the UK, who also introduced the Hawk-Eye and the Red Zone.[14]

3. Hotspot:

Hot Spot is an infrared imaging system used in cricket to determine whether the ball has struck the batsman, bat or pad. Hot Spot requires two infra-red cameras on opposite sides of the ground above the field of play that are continuously recording an image. Any suspected snick or bat/pad event can be verified by examining the infrared image, which usually shows a bright spot where contact friction from the ball has elevated the local temperature. Where referrals to an off-field third umpire are permitted, the technology is used to enhance the on-field umpire's decision-making accuracy. Where referrals are not permitted, the technology is used primarily as an analysis aid for televised coverage. [15]

4. Spider cam:

The Spider cam is a system which enables film and television cameras to move both vertically and horizontally over a predetermined area, typically the playing field of a sporting event such as a cricket pitch, football field or a tennis court. The name Spider cam is a trademark. The Spider cam system is modelled after Sky cam, which preceded it, having been invented in the United States in 1984.

The Spider cam operates with four motorized winches positioned at each corner at the base of the covered area, each of which controls a Kevlar cable connected to a gyro-stabilized camera-carrier, or dolly. By controlling the winding and unwinding of the cables, the system allows the dolly to reach any position in the three-dimensional space. The inputs of the Spider cam "pilot" are processed by software which forwards the commands to the winches via fiber optic cables. Two of the Kevlar cables also have fiber optic cables woven into them to carry commands to the camera and the remote head, and bring the camera's high definition signal back to the control station. The remote head, which houses the camera, provides pan and tilt movement and includes the lens remote which controls focus, zoom and arising. A gyro sensor in the dolly stabilises the horizon. A specially trained Spidercam camera operator controls the camera.

5. Helmet camera:

A helmet camera, otherwise known as a micro video camera, bullet camera, or is an action camera, usually a closed circuit television camera, attached to a helmet allowing someone to make a visual record from their point of view (POV), while keeping their hands and vision free. Archives containing photos of helmet cameras

51

have surfaced over the last decade. One shows Denver Broncos backup quarterback Jacky Lee wearing a helmet camera at football practice in 1965. Another early helmet video camera was a 1977 head-mounted camera designed to convert images into tactile sensations for the blind.[17]

6. Rotoscoping:

Rotoscoping is an animation technique used by animators to trace over motion picture footage, frame by frame, when realistic action is required. Originally, photographed live-action movie images were projected onto a glass panel and re-drawn by an animator. This projection equipment is referred to as a rotoscope, developed by Polish-American animator Max Fleischer. Although this device was eventually replaced by computers, the process is still referred to as rotoscoping.

In the visual effects industry, rotoscoping is the technique of manually creating a matte for an element on a live-action plate so it may be composited over another background. The rotoscope technique was invented by Polish-born animator Max Fleischer, and used in his groundbreaking *Out of the Inkwell* animated series known simply as "Fleischer Process" on the early screen credits, and was essentially exclusive to Fleischer for several years. The live-movie reference for the character, later known as Koko the Clown, was performed by his brother (Dave Fleischer) dressed in a clown costume.[15]

7. Motion capture:

Motion capture (Mo-cap for short) is the process of recording the movement of objects or people. It is used in military, entertainment, sports, medical applications, and for validation of computer vision and robotics. In filmmaking and video game development, it refers to recording actions of human actors, and using that information to animate digital character models in 2D or 3D computer animation. When it includes face and fingers or captures subtle expressions, it is often referred to as performance capture.[In many fields, motion capture is sometimes called motion tracking, but in filmmaking and games, motion tracking usually refers more to match moving.[16]

8. Motion tracking:

1982-1983 Graphical Marionette With motion tracking, you can track the movement of an object and then apply the tracking data for that movement to another object—such

as another layer or an effect control point—to create compositions in which images and effects follow the motion. Commercial optical tracking systems such as the Op-Eye and Selspot systems began to be used by the computer graphics community. Both MIT Architecture Machine Group and the New York Institute of technology Computer Graphics Lab experimented with optical tracking .Both systems used wired LED's attached to body to track movement but had major speed limitations .Early systems could track only a dozen or so markers at a time.[16]

9. Underwater cameras:

The vital part of the system, the underwater camera, has a waterproof housing. The housing has a finish that withstands corrosion and chlorine which makes it perfect for use in basins and swimming pools. There are two types of cameras. Industrial high-speed-cameras can also be used as infrared cameras. The infrared underwater cameras comes with a cyan light strobe instead of the typical IR light—for minimum falloff under water and the high-speed-cameras cone with an LED light or with the option of using image processing. A underwater camera is typically able to measure 15–20 meters depending on the water quality, the camera and the type of marker used. Unsurprisingly, the best range is achieved when the water is clear, and like always, the measurement volume is also dependent on the number of cameras. A range of underwater markers are available for different circumstances. Different pools require different mountings and fixtures. Therefore, all underwater motion capture systems are uniquely tailored to suit each specific pool installment. For cameras placed in the centre of the pool, specially designed tripods, using suction cups, are provided.[20]

10. Masking:

The masking effect or masking is a visual style, dramatic convention, and literary technique described by cartoonist Scott McCloud in his book Understanding Comics in the chapter on realism. It is the use of simplistic, archetypal, narrative characters, even if juxtaposed withdetailed, photographic, verisimilar, spectacular backgrounds. This may function, McCloud infers, as a mask, a form of projective identification. His explanation is that a familiar and minimally detailed character allows for a stronger emotional connection and for viewers to identify more easily. It is used in animation, comics, illustration, videogames (especially visual novels) and other media. It is common

52

in Western graphicnovelsand Japanese comics and animation. The psychology behind the masking effect has been extended to rendering antagonists in a realistic manner in order to show their otherness from the reader. [10] proposed a system about Efficient Sensor Network for Vehicle Security. Today vehicle theft rate is very high, greater challenges are coming from thieves thus tracking/ alarming systems are being deployed with an increasingly popularity .As per as security is concerned today most of the vehicles are running on the LPG so it is necessary to monitor any leakage or level of LPG in order to provide safety to passenger. Also in this fast running world everybody is in hurry so it is required to provide fully automated maintenance system to make the journey of the passenger safe, comfortable and economical. To make the system more intelligent and advanced it is required to introduce some important developments that can help to promote not only the luxurious but also safety drive to the owner. The system "Efficient Sensor Network for Vehicle Security", introduces a new trend in automobile industry.

Conclusion:

Drone technology are growing in common and general interest for civil applications, providing good connectivity and links to the users. through this survey we work on the energy efficiency, higher clarity of image processing. Energy efficiency is a very important mechanism in drone technology, reducing the energy consumption which helps in increase in lifetime and carrying of higher payloads. Drone technology which is mainly used for high level area coverage and fault tolerance.

Future work:

The battery life of a drone where it need to stay awake for a long period of time in order to capture or record a long session on entertainment purpose or to capture long time events. Drone trafficking system which is a development stage at which the controlling of the traffic in the roads which is to be reduced better than the current situation. Transferring of objects from one place to the another where the messaging system which plays a vital role for the message transferring through drones. Drones developed for the early warning system which actually alerts the area in the case of any natural disaster sensing the change in temperature or environment. Drones based on business activity monitoring and also emergency system.

References:

[1] Andrea.R.D, ``Guest editorial can drones deliver?'' IEEE Trans. Autom.Sci. Eng., vol. 11, no. 3, pp. 647_648, Jul. 2014.

[2] Bellovin.S.M, Clark.D.D, Perrig.A, and Song.D. (2006).A Clean-Slate Design for the Next-Generation Secure Internet.[Online].

[3]Raptopoulos.A (2013). No Roads? There is a Drone for That.

[4]Clerckx.B and Bayguzina.E, "Waveform design for wireless power transfer," IEEE Trans. Signal Process., vol. 64, no. 23, pp. 6313–6328,Dec. 2016.

[5] Gross.D. (2013). Amazon's Drone Delivery: HowWoulditWork?[Online].Available:http://www.cnn.com/2013/12/02/tech/ innovation/amazon-drones-questions/.J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68-73.

[6] FAA. (2011). Unmanned Aircraft Systems Aviation ulemakingCommittee.[Online].Available: http://www.faa.gov/regulations_policies/rulemaking/committees/documents/media/UASARC-20110617.PDF.

[7] FAA. (2013). Integration of Civil Unmanned Aircraft Systems (UAS)in the National Airspace System (NAS) Roadmap. [Online]. Available http://www.faa.gov/uas/media/UAS_Roadmap_2013.pdf.

[8] FAA. (2015). Operation and Certi_cation of SmallUnmannedAircraft Systems. [Online]. Available:http://www.faa.gov/regulations_policies/rulemaking/recently_published/media/2120-AJ60_NPRM_2-15-2015_joint_signature.pdf.

[9] FedEx Corporation. (2015). Q1 Fiscal 2015 Statistics.[Online].Available:http://investors.fedex.com/_les/doc_downloads/statistical/FedEx-Q1-FY15-Stat-Book_v001_t195uu.pdf.

[10] Christo Ananth, I.Uma Sankari, A.Vidhya, M.Vickneshwari, P.Karthiga, "Efficient Sensor Network for Vehicle Security", International Journal of Advanced Scientific and Technical Research (IJST), Volume 2, Issue 4, March-April 2014,pp – 871-877

[11] Andrea.R.D, ``Guest editorial can drones deliver?'' IEEE Trans. Autom.Sci. Eng., vol. 11, no. 3, pp. 647_648, Jul. 2014.

[12] Nolan.M.S, Fundamentals of Air Traffic Control,5th ed. Clifton Park,NY, USA: Delmar, 2010

[13] United States Government Publishing Office. (2010).Automatic Dependent Surveillance Broadcast (ADS_B) out performance requirements

53

to support air traffic control (ATC) service.

[14] Zhang, J. and S.S. Dawes, Expectations and Perceptions of Benefits, Barriers, and Success in Public Sector Knowledge Networks. Public Performance & Management Review, 2006. 29(4): p. 433-466.

[15] Fay, Steven (21 May 2000). "First the snickometer, now for the lbw detector". The Independent. Retrieved 17 June 2010.

[16] "NINE unveils new 'HOT SPOT' cricket technology". Nine Network. 2006. Archived from the original on 5 July 2007. Retrieved 26 July 2007.

[17] The Denver Post, "Broncos wore helmet
Cameras long before GoPro
was born, by Nicki Jhabvala, August 30, 2015
http://blogs.denverpost.com/broncos/2015/08/30/bronco
s-wore-helmet-cameras-long-before-gopro-was-
born/35169

[18] Selvin, Joel (2002-04-22). "The day the music lived". San Francisco Chronicle.

[19] Goebl, W.; Palmer, C. (2013). Balasubramaniam, Ramesh, ed. "Temporal Control and Hand Movement Efficiency in Skilled Music Performance". PLoSONE. 8 (1):e50901. doi:10.1371/journal.pone.0050901. PMC 3536780 . PMID 23300946.

[20] Scott Gietler Underwater Photography Guide Lighting with Strobes