Controlling Unmanned Ground Vehicle by Smart Phone

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Abstract **- Smartphone is a basic device. Used communication in modern times the ability of the Smartphone to be used in the control. Unmanned Ground Vehicle (UGV) is mobile based on the control of the Smartphone. The Android operating system, creating Smartphone applications, is capable of moving beyond the mobile. Can also send pictures show UGV's trip and can capture event photos. This application is used for survey at dangerous place that prevents travel by human.**

Keywords **- Unmanned Ground Vehicle, Smart Phone, Android**

I. INTRODUCTION

Unmanned aircraft has a long history of development. Also known as Unmanned Ground Vehicle or UGV. Historically, military use was normal and developed by high-cost technology. Now Daily equipment such as Smartphone technology. Can use a variety of communications. There are Smartphone applications available in applications such as: the internet, music, movies, and even application development, extending the capabilities of Smartphones such as navigation maps. Because Smartphones often have GPS sensors in place and Accelerometer Capture the sensitivity of the payment flow through the Smartphone via NFC to send business cards via Bluetooth. In addition, the Smartphone is believed to be a microcontroller. To control certain devices such as Unmanaged Vehicle control for travel under the control of a Smartphone. This Unmanned Vehicle can perform the mission instead of humans. The only basic device is a Smartphone. The cost of building a no-man vehicle price is not high in the past. The concept of using basic devices used in everyday life such as Smartphone. Control the Unmanned Vehicle is expanding taking advantage of this basic device, getting more outgoing calls and cheaper bills.

This article shows how to create an application that is installed on a Smartphone. Specifically, the Android Operating System controls Unmanned Vehicles. Through Wireless Communication, Unmanaged Motor Vehicles have an IOIO Microcontroller that works only with Smartphones. Provides motor control in Unmanned Vehicles and movies can be sent to know the current location. To control the direction of movement and make interesting images.

II. LITERATURE REVIEW

Sheridan [1] classifies Unmanned aerodynamic control into 3 levels: manual control; control by advice; and control by the craft itself. At present, the research focus on the driver in the latter two very well and emphasize the task of military utilization. Which uses a lot of device capabilities and

high prices. But since the present the capabilities of everyday devices like Smartphones. Has a much higher ability. Developed interests from basic equipment it is cost effective.

Harding and Whitty [2] offers Android Applications. To control the Unmanned Vehicles. Developed from Open-Source Software, this Unmanaged Vehicle can move itself and can travel through obstacles. Follow the route as specified. This is a good guide to the development of low-cost vehicles, while Evans [3] offers small Unmanned Vehicles. Perform multitask military missions, such as exploratory exploration on iOS and Android Systems, where soldiers have these basic Communications equipment. Simply install the Application Software. It is available in Unmanned craft. Kazi [4] offers Unmanned Vehicles, you can follow the path itself through various obstacles. Armed with microcontroller, Arduino works in conjunction with an obstacle detector and Android remote control.

It is seen that the trend of Unmanaged Vehicle control applications can be developed using only a low cost device but effective.

III. METHOD

Unmanned Vehicles using Android Smartphones control movement in different directions through Wireless Communication Wifi sent to control the Unmanned Vehicle. The Unmanned Vehicle has another Android Wifi receiver and sends it to the IOIO Board of the control board. The Microcontroller Board is connected to the Unmanned Wheel Motor.

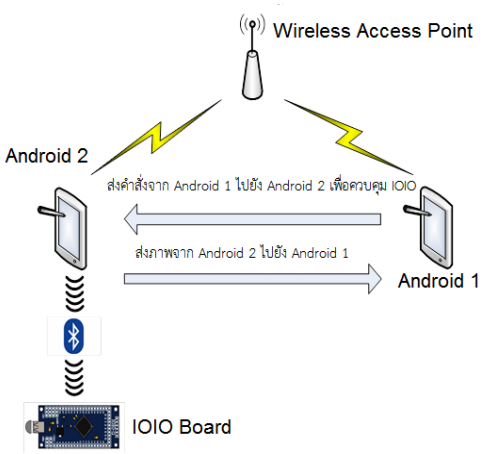

Fig. 1 Overview of Unmanned Vehicle Systems

Equipment to build Unmanned Vehicles: IOIO-Q Board; IOIO-Robotic Activity Board; and IOIO Bot. These devices are connected to Android Smartphones. To make these boards work, the IOIO-Q Board is a circuit board. Microcontrollers it also supports input and output through general purpose input output (GPIO), I2C, and UART, which is enough to control. Devices IOIO-Robotic Activity Board is an extension board that sends messages to the IOIO Bot or Unmanaged Vehicle or robotic device (IOIO Bot).

Fig. 2 IOIO-Q Board

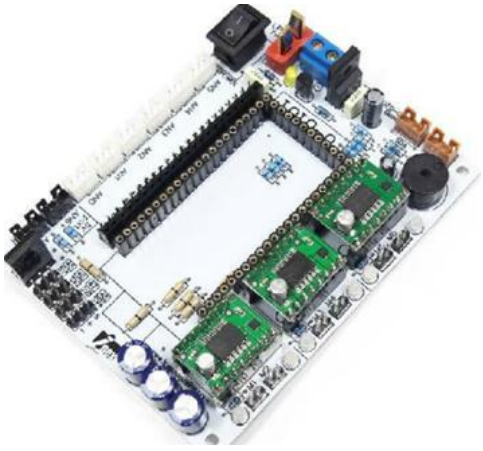

Fig. 3 IOIO Robotic Activity Boards

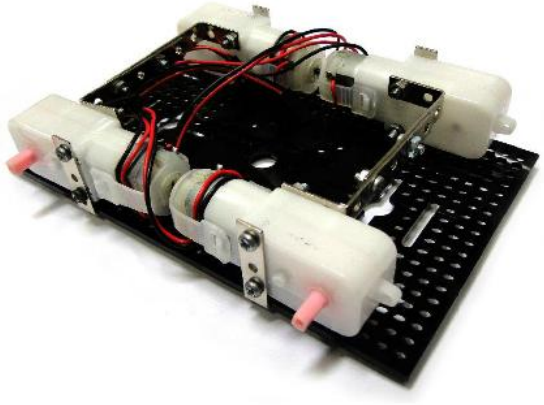

Fig. 4 IOIO Bot Board

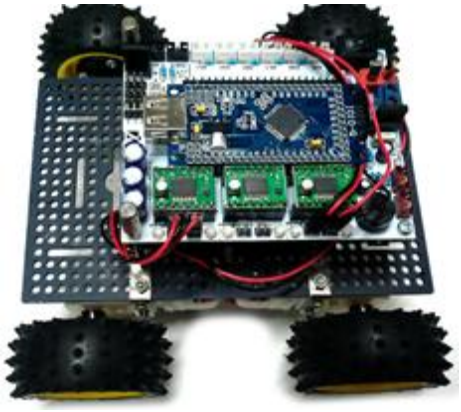

Fig. 5 IOIO Board assembly on IOIO Bot

IV. IMPLEMENTATION

The application uses the library that comes with the IOIO Board, IOIOLib [6], to control the IOIO Bot, and use the take snapshot application [7] for recording. System of application control of Unmanned Vehicles. Can be installed on an Android Smartphone with encryption. Before entering control mode the program can set the sharpness of the picture. Assign IP address connected to Android on the IOIO Bot.

Control of Unmanaged Vehicles use the Android touch screen to scroll left and right, and follow the images sent to Android. Commit to the right to make the right move in the safe direction, it can record events of interest.

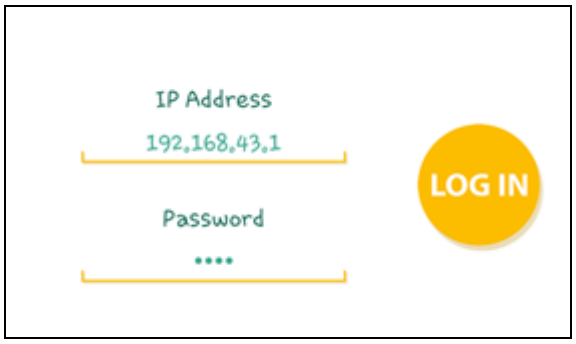

Fig. 6 Screens on the Smartphone.

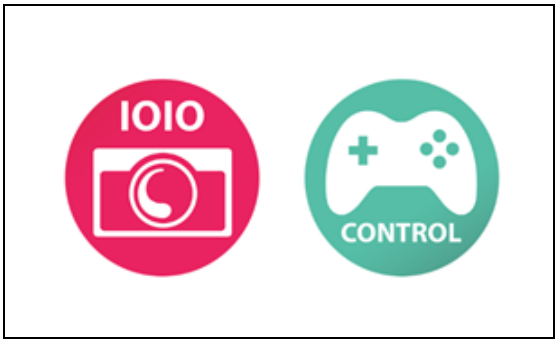

Fig. 7 Setup and Control Screen

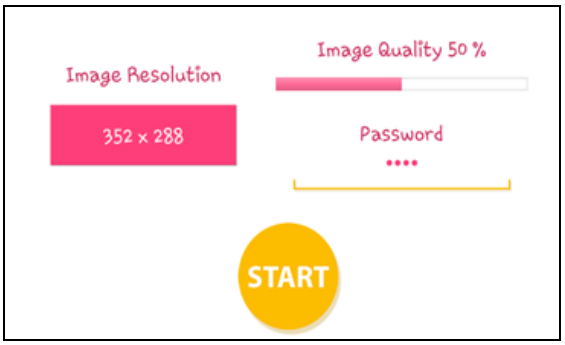

Fig. 8 Screens on the Smartphone
(Picture Settings)

Fig. 9 The Unmanaged Vehicle Control Screen

V. CONCLUSION

Small Unmanned Vehicle working on the Android system can decide on the images sent

to the Smartphone to make the journey through the right foot and can capture event images. It is a Smartphone application used in daily life. It is a low-cost, Unmanned Vehicle but it worked well in the survey. For dangerous areas instead of humans. This invention there are no restrictions on automatic control. Travel yourself to add sensors to detect obstructions or use a barrier image without any additional sensors. This is a challenge for further.

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(Arranged in the order of citation in the same fashion as the case of Footnotes.)

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