**Unmanned Aerial Vehicles**

**Introduction**

Unmanned aerial vehicles (UAVs), always being referred as “drones”, utilize camera, sensors, single board computers and some other elements to achieve flight controlling and complete the tasks. Provided with the target, the UAV is able to trace the target; in the building with wireless Internet, the drone may explore the whole building without being manually controlled and will return the data, such as the depth, length and width as well as some photos of the building’s environment. Moreover, the UAVs can send back the data about the location of themselves. This paper is a review of auto-drive drone technology for tracing and exploring the environment.

**Commercial Applications for Unmanned Aerial Vehicles**

1. **Delivery**

Currently, the online stores such as Amazon are manually delivering the products, which usually take 3-8 days. The cost of normal delivery is around 5.95 dollars, and if the customers require faster delivery, the cost will increase to 20.95 dollars. However, drone could allow business to deliver products to customers without having to send (or even hire) a driver and last year, a team of engineers in California launched the Burrito Bomber, a UAV that uses GPS coordinates to drop burritos by parachute [1].

Moreover, Domino’s pizza has already put up a video showing to deliver pizza via drone in New Zealand [2]. In the video the pizza box is hanged under a UAV and is delivered by the stretching string attached to the drone to the ground successfully.

1. **Population Counting**

David Bird, a wildlife biology professor, used the drones with four blades to count the population of the birds. Previously, scientists need to present on the aircraft in order to perform similar tasks and many of them died because of the aircraft crash. But with the help of drone, the risk of scientists will be reduced and the cost is less, usually $1,300 or less. The drone built by Professor Bird is a Self-built drone made from a model airplane, autopilot software, and a camera; less than $2,000 [3].

**Technology of Unmanned Aerial Vehicles**

1. **Cameras**

# The drone uses the camera to take photos and process the pictures in order to decide its routine. Most of the drones sold online are attached with cameras supporting HD 720P or 1080P MOV video quality and range from 2MP to 16 MP [4].

1. **Sensors**

Sensors will be utilized to determine the environment of drone, such as the distance of from the wall, the depth of the building and the location of the aerial vehicle. Sonar, for example, is one of the most common sensors used in drone.

1. Single Board Computer

Single Board Computer is used to program and control the UAVs. Currently there are many types of SBCs that can both be on drones or as base station on ground [5]. Most of the SBCs intended to be on drones are using 5V DC/2A power and the power consumption depends on the load of the boards [6].

[1] Adam C. Uzialko, “7 Cool Commercial Drone Uses Coming to a Sky Near You,” in *Business News Da*ily, July 27, 2016.

[2] “Domino's delivers pizza by drone in New Zealand,” August 26, 2016.

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[3] Nancy Averett, “Drones Take Off as Wildlife Conservation Tool,” in *Audubon Magazine*, July-August 2014

[4] [Alan Perlman](http://uavcoach.com/author/alanperlman/), “10 Best Drones With a Camera: Top Choices for Aerial Photography,” [April 15, 2016](http://uavcoach.com/drone-with-camera/).

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