

ADVISORY BOARD MINUTES
Palomar College Unmanned Aircraft System (UAS) Program
Karl Strauss Beer Garden October 8, 2015

Members Present:

FIRST	LAST	TITLE	PROFESSIONAL AFFILIATION
Dhore	Anunciado	CFO	Action Drone
Darryl	Anunciado	CEO	Action Drone
Sherdellah	Anunciado	CMO	Action Drone
Brock	Ortega	Principal	Dudek
Douglas	Goodwin		Horizon RPV
Alex	Fuller	Co-founder	INOVA Drone
Chad	Ammon	CEO	INOVA Drone
Mark	Bealo	Faculty, GC Dept.	Palomar College
Wing	Cheung	Faculty, GIS Dept.	Palomar College
Ken	Dodson	Chair, GC Dept.	Palomar College
Kim	Gearhart	GC Alum	Palomar College
Michele	Dallachiesa	CTO	Skysense

The meeting of the Palomar College Unmanned Aircraft System (UAS) Program Advisory Board for was called to order at 6:15 pm, October 8, 2015 by the Advisory Board Chair, Wing Cheung.

Welcome and Introductions

The members introduced themselves and their specializations.

Statement of Purpose

Mark Bealo outlined the purpose of this meeting and the Advisory Board:

- Providing information about changing technology.
- Providing labor market status to keep our program connected to industries.
- Making suggestions about our current curriculum to prepare students for jobs.
- Making recommendation of how to make connections between college and companies

Curriculum Development

- Safety and regulations needs to be covered in all courses.
- The program needs to emphasize safety and regulations. Students should be asked to complete a pre-flight checklist, and concentrate on the planning of flights.
- Ground school will be a good recommended preparation for the advanced drone imaging class (not the introductory course as the volume of information may be too much for introductory students). Students who are interested in commercial applications of drones should definitely complete the ground school class, recreational users should be encouraged to take the ground school class in order to learn to respect the airspace.

- Repair and basic flying skills should be covered in a separate class from the processing of UAS data.
- Different ways of flying and different UAS will be needed for different clients even within the same industry (e.g. agriculture), so it is good to teach different drones and different sensors.
- The certificate should provide students with a well rounded understanding of the operations/flying of drones, regulations and safety surrounding UAS operation, and a basic understanding of GIS and remote sensing (so they can understand the GIS users' needs and data requirement). Emphasis also needs to be placed on data management, as UAS can produce a large volume of data.

Needs

- Palomar should look into getting a flight cage for students to practice flying. The cage should not be a square, but should vary in geometry and height. (<http://whnt.com/2014/08/11/uah-created-fenced-in-fly-zone-for-air-robots/>)
- Students should first learn how to fly using flight simulation software, examples are AeroSim, Phoenix. Getting 8 to 10 licenses should be enough given that students can rotate between learning how to fly and learn how to repair and build UAS.
- <http://www.aeroflyrc.com> runs on a Mac.
- Other flight simulation software may require booting up in Windows on a Mac computer.
- The simulation software should implement the same radio controls the students will be using when operating the UAVs.
- The different sensors that students should learn include FLIR, thermal infrared, NDVI, near-infrared and possibly LiDAR if the technology becomes cost-effective.

Industry Assessment / Labor Market Update

- The job market for UAS operators is characterized as an evolving job market depending on the direction of the regulatory regime.
- Overall, the demand for UAS operators is high. As one member said "I can tell you it's going to be big."
- The jobs will mostly be in the service-oriented industry, and "in any industry [that is] visually related." Specifically, job opportunities are likely to arise in the gas/utility industry and situational awareness. In fact, SDGE is already testing UAS for inspection. Other major employers of UAS are in the fields of agriculture, mapping, inspection, and public safety (border safety, coast guard, fire).
- The advent of UAS may possibly displace workers, but will most likely require the retraining of technicians such as roof and building inspectors as well as cell tower inspectors to become proficient in using UAS.
- By looking at section 333 exemptions that have been granted by the FAA to commercial users, the largest percentages of users that were granted exemptions were in the photography and agricultural. This confirms that UAS are being heavily used in those industries.