Best Practices for Data Collection with Small UAS

CRASAR Principles and Observations

- Having permission to fly in an airspace is not the same as having permission to photograph the ground under the airspace. Be aware of, and honor, regulations and be considerate.
- Chain of custody policy is critical as it impossible to predict how the data will be used in the future:
  - Agencies may have public accountability issues (where/when did the data come from? was any chance of error or tampering?)
  - There may legal or forensic data in the images, including data that may be used only much later
  - There may be deceased or personally identifiable information in the data that is not obvious at first
- If flying for an agency, then the agency controls the data and all press goes through their public information officer (PIO). Establish the data policy (e.g., “flier gives agency complete set of data and meta-data. Flier is allowed to keep a copy but releases to public only with approval by agency”) in writing or email before flying as part of the request.
- Fly and deliver useful data, then ask for permission to tweet and post using approved images. Agency PIOs are generally happy to give permission plus distribute through their media contacts and even provide quotes once they see it works and isn’t just a publicity stunt. Ask what data can be released to the public and with what attribution.

Data

- Record what the safety observer is seeing (ex. put GoPro on their hat)
- Record what the operator control station is displaying
- Take photographs of the landing zone to establish context
- Have a logbook and bag/box for storing original SD cards or other media for maintaining chain-of-custody, log when a copy is made and by whom.
- Upon landing
  - Immediately back up data; keep in a separate, secure location
  - Create meta-data summary
  - Depending on mission, Create “snippets” of video to help stakeholders find relevant info, e.g., edit out take off and landing
  - Depending on mission, Compile significant photos

Meta-Data: Data About the Flights

- Needed for aviation compliance and disaster coordination. The aviation authority and the requesting agency or stakeholder will need to know when and where a UAS was flown as well as with what platform and payload.
- Needed for the future. Scientists and technologists need the data to determine what is working and generate better concept of operations
- 1 report/power point slide per flight with the original data summarizing:
  - Vehicle type, weight, dimensions, payload, control: planned path, manual, both
  - Date, Time of flight, Duration of flight
  - Mission and team members (pilot, safety officer, mission specialist, …)
  - Wind conditions, Weather conditions (temperature, rain, clouds), Average or nominal altitude, Farthest distance from home,
  - Satellite image of area with Landing zone: on map and a context shot showing the area, Planned path (if planned), Breadcrumb of actual flight path, Sensor coverage: estimated polygon drawn on map- where you really got imagery
  - Mosaic or Ortho-mosaic (if produced)

See Chapter 6 Disaster Robotics (R. Murphy, MIT Press, 2014) for more details on data collection and human subject protection regulations impacting collecting and publishing data that includes people

©2015 Center for Robot-Assisted Search and Rescue crasar.org