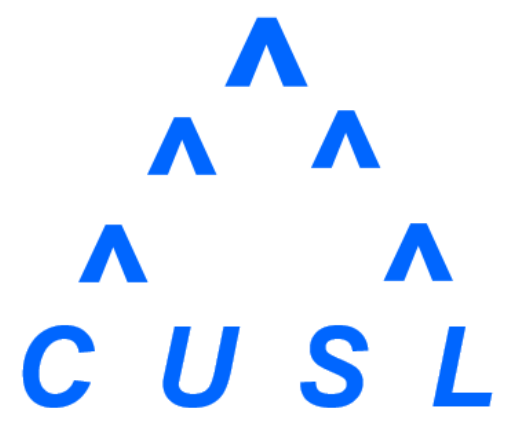




In-Situ and Remote Sensing of the Environment Using KHawk UASs

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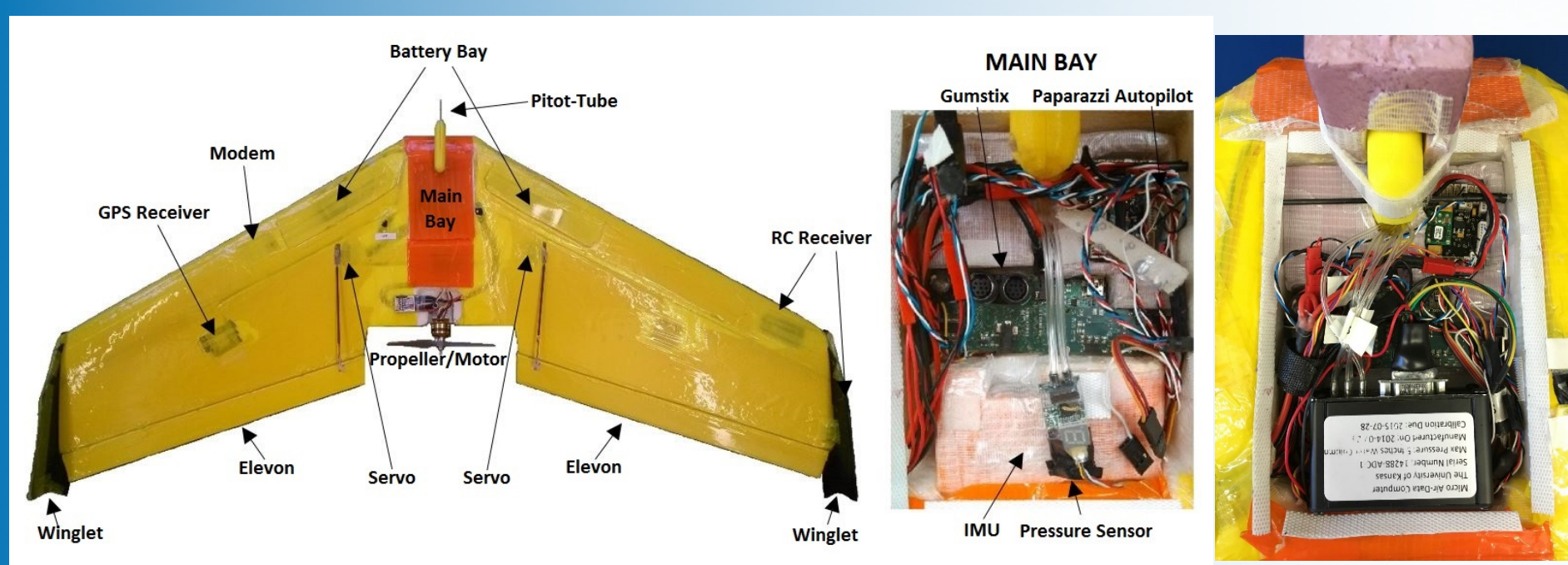


BACKGROUND

With the emergence of Unmanned Aircraft Systems (UASs), critical geographic information becomes much easier and cheaper to acquire than ever before. UASs can deliver geographic information in real time at low cost. UASs are especially useful for dangerous, dirty, and dull missions, because UASs can collect information without risking human life.

PLATFORMS

KHawk UASs were developed by researchers from Cooperative Unmanned System Laboratory (CUSL) at the University of Kansas. With a variety of sensors carried onboard, KHawk UASs can be used for both in-situ sensing and remote sensing of the Earth and environment. Typical sensors include cameras at different spectral bands (RGB/NIR/thermal), temperature, humidity, pressure sensors, GPS receiver, and IMU (Inertial Measurement Unit).

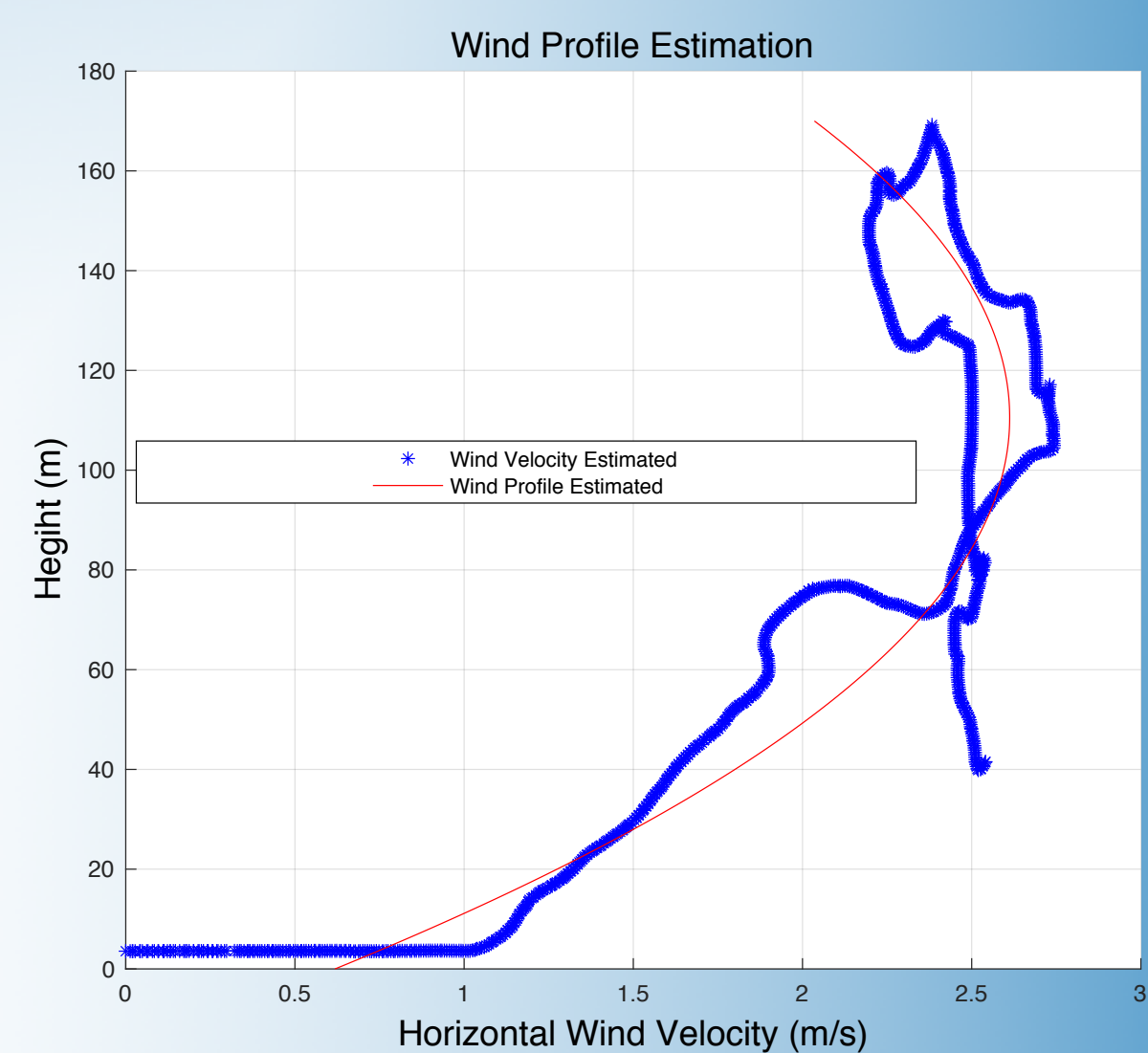


	KHAWK 2 UAS	KHAWK 55 UAS
Purpose	Remote Sensing	In-Situ Sensing
Wingspan	46 in	55 in
Weight	3.5 lbs	5.8 lbs
Payload	1 lbs	1.5 lbs
Endurance	30 minutes	35 minutes
Sensors	GoPro RGB/NIR	Aeroprobe 5 Hole Pitot-Tube

METHOD AND DATA ANALYSIS

In this work, KHawk UASs were used for in-situ sensing of the local 3D wind field and for remote mapping of the Clinton Lake RC aircraft flying field. The local 3D wind was estimated by an extended Kalman filter using measurements from onboard sensors, including GPS, IMU, and pressure sensors. The aerial field map was stitched from multiple aerial images collected by an onboard GoPro Hero camera with modified lens.

RESULTS



CONCLUSIONS

KHawk UASs developed by CUSL are capable of supporting both in-situ and remote sensing missions. The geographic information delivered by KHawk UASs can be used for search and rescue missions, disaster monitoring and damage assessment (such as tornado, hail, thunderstorm, wildfire, and earthquake). It can also be used for many other civilian applications such as agricultural monitoring, meteorological measurement, and environmental monitoring.

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