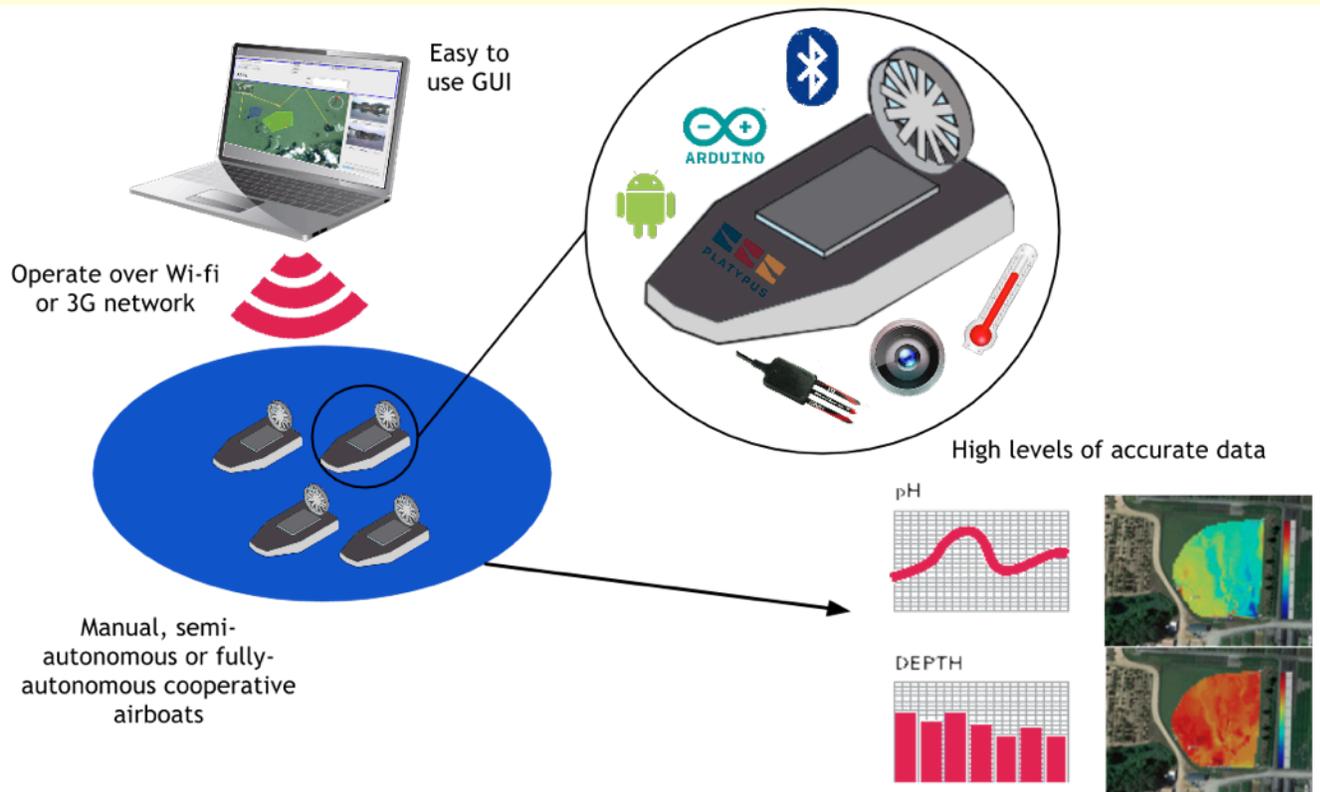# PLATYPUS

AUTONOMOUS COOPERATIVE AIRBOATS

Platypus LLC offers Universities the opportunity to purchase low-cost airboats for use in environmental monitoring and robotic research

Easy to use GUI

Operate over Wi-fi or 3G network

Manual, semi-autonomous or fully-autonomous cooperative airboats

High levels of accurate data

pH

DEPTH

The Lutra Airboat 1.1

The Lutra 1.1 grants users the ability to autonomously collect data on a range of water characteristics, enabling environmental analysis and further research. Advanced users can exploit the open source code to experiment with autonomous robotic control and conduct their own research within this field.

Website: www.senseplatypus.com
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PLATYPUS LLC is a Pittsburgh, PA based company formed around technology developed at Carnegie Mellon University's Robotics Institute. Platypus founders are all former or current CMU employees.

Platypus is dedicated to the development of low-cost technology that will make environmental data easier and less expensive to collect.
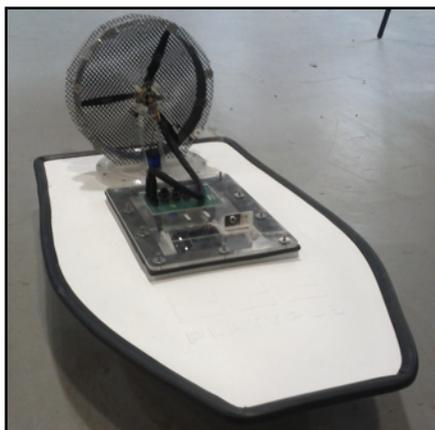
Environmental Monitoring

Platypus can provide students with a low-cost means of collecting high levels of data autonomously. The Lutra 1.1 includes four digital and four analog connection ports, granting the opportunity to use up to eight sensors at once. The simplistic nature of connections means the USV has the capability to work with most generic sensors. This allows students to use a single interface to monitor a range of water characteristics including:

--Depth   --Ph Levels   --Bromine
--Electrical Conductivity   --Temperature   --Dissolved Oxygen
--An onboard camera also allows the USV to capture photos

Platypus offers free tech support to ensure students can alter the Lutra's sensing capabilities to match their requirements.

When conducting research, high levels of data taken at continuous intervals provides for more accurate results. Using attached sensors each Lutra 1.1 is capable of obtaining over 50,000 data points per day allowing students to quickly build up a database suitable for analysis. The robust nature of each USV ensures that data collect can occur in most conditions. In fact, a key goal of Platypus is to provide boats capable of delivering awareness and emergency supplies in flood waters. Students can also purchase a solar powered recharge stations that allow for recurring, unsupervised collection, ensuring they spend more time analyzing data and less time collecting it.

Robotic Research

Designed and built at top ranking robotics university Carnegie Mellon in Pittsburgh, the Lutra 1.1 grants students the opportunity to use advanced USV technology at extremely low cost.

The USV software is based on an effective information sharing algorithm to allow multiple boats to work together to cover a large area. Communication between each USV is achieved via onboard Android phones running Eclipse. This cooperative nature minimizes repeated sampling and ensures efficient use of both energy and time. As this is completely autonomous, each user is therefore able to individually deploy and control multiple boats at once.

In addition to stable autonomous movement, the Lutra 1.1 can perform tasks including navigation of waypoint/area via GPS, minimize or conserve energy and data collection under a range of algorithms (eg. Lawnmower, time minimization, uncertainty minimization). Ongoing research is focused on efficiency gains and larger boats for use in the ocean or extreme weather, such as flood emergency response. This research ensures a focused team at Carnegie Mellon will be providing upgrades and be available for advice to students.

The Lutra 1.1 uses Netbeans for GUI, Eclipse on a Nexus 7 android phone and C++ MakeFiles for its firmware. As the code is open source, the platform allows for students to experiment and make changes to the systems as they require.

Tech Specs

Price: $3000 for airboat, Optional router/antenna for $200. Includes free technical support

DIMENSIONS
90x50x45 cm (LxBxH)

WEIGHT
14 lb

SPEED
5-6mph for sampling (typical), 8mph without sampling

COMMUNICATION
Wireless 802.11b/g/n, 3G, EDGE

MIN REQ DEPTH
15 cm

ENVIRONMENTAL IP 66
-10 / +40 °C

HULL
Vacuum Formed ABS

FEEDBACK
Battery Status, Location, Heading, Temperature on board boat

CONTROL
Full-Autonomous, Semi-Autonomous and Tele-Op

PLATYPUS