

Joint Electrical Engineering Institutions' Program 2013

IEEE NSW Section – Joint Chapter Communications/ Signal Processing/ Oceanic Engineering Societies

Marine Science & Ocean Systems Engineering

Date / Time: Thursday 8th August 2013 6.00pm to 7.00pm

Light refreshments from 5.30pm

(The Technical Meeting will be followed by an Administrative Meeting over dinner at a local restaurant in Chatswood. Members and guests are welcome but **RSVP is essential**).

Venue: Engineers Australia Harricks Auditorium
8 Thomas Street (Near Chatswood Railway Station and Bus Interchange)

Speakers: 1. Darren Burrowes, Chief Technology Officer, UVS Pty Ltd
2. Dr Brian Ferguson, Principal Scientist and Engineer, DSTO

Registration on Engineers Australia website is essential: confirmation will be provided by email. Seating limited to 120 persons.

First Presentation: *Wave Glider Autonomous Surface Vehicles and the Pacific Crossing*

Abstract: By continuously harvesting energy from the environment, Wave Gliders are able to travel long distances, hold station, and monitor vast areas without ever needing to refuel. A unique two-part architecture and wing system directly converts wave motion into thrust, and solar panels provide electricity for sensor payloads. This means that Wave Gliders can travel to a distant area, collect data, and return for maintenance without ever requiring a ship to leave port and they promise to revolutionise many data collection tasks in the ocean. On 20 November 2012 UVS www.uvs.com.au supported Liquid Robotics www.liquidr.com in the recovery of the "Papa Mau" Wave Glider after completion of its historic and record breaking Pacific Crossing www.liquidr.com/pacx. Darren Burrowes' presentation will provide an introduction to Wave Glider technology, lessons learned from the PacX crossing and information on upcoming Wave Glider developments.

Second Presentation: *Problems With Wide Aperture Acoustic Arrays for Source Localization*

Abstract: In its simplest form, a wide aperture array consists of three acoustic sensors which are widely spaced along a straight line. This sensor configuration forms two adjacent sensor pairs with the middle sensor common to both pairs. The instantaneous source position is estimated using time delay measurements from the two adjacent pairs of sensors, i.e. the source position is localized in range with respect to the middle sensor and relative bearing with respect to the array axis. Brian Ferguson will present the results of localizing sources with various wide aperture acoustic arrays deployed on land and under water. Problems associated with passive acoustic broadband source localization using wide aperture arrays are addressed including range bias errors arising when the sensor positions are not strictly collinear, source position uncertainty when the sound propagation medium is nonstationary, and decorrelation of the signals received from a moving source (which is caused by differential time scaling and occurs for certain source-sensor geometries).

Note: Attendance may be credited towards Engineers Australia's Continuing Professional Development (CPD) pts

