

PhD Scholarship at Australian Centre for Space Engineering Research

Required Background: Bachelor / Masters Degree in Elec. / Telecom. Engineering
Preferred Experience: Wireless Communications, Signal Processing
Application Deadline: 31/03/2012
Supervisors: Nagaraj Shivaramaiah, Prof Andrew Dempster
Contact: Nagaraj Shivaramaiah (nagaraj@unsw.edu.au)

Unified Signals for Communication and Navigation

The principal aim of this research is to investigate potential signal structures and modulation schemes that integrate “communication” and “positioning and navigation” technologies. Most of the wireless/satellite communication and the positioning/navigation technologies that exist today share some commonalities in the underlying fabric yet being different at the signal level due to several challenges.

Currently, many communication signals are being treated as “signals of opportunity” and are being explored for their positioning and navigation capabilities. Preliminary studies from researchers across the world have shown that the signals across a broad range of radio spectrum, from VHF to S-band, designed originally for communication and broadcast purposes possess primary or secondary positioning capabilities. These signals include Frequency Modulation (FM), Digital Video Broadcasting (DVB), Wireless Local Area Network (WLAN), Ultra Wide Band (UWB), Radio Frequency Identification (RFID), and Cellular to name a few. Each of these signals offer different levels of positioning accuracy and most often have distinct applicability.

It is of interest to investigate in detail the properties of communication and broadcast signals, including the emerging multi-carrier and multiplexing techniques, that help either absolute or relative positioning and navigation, and to come up with novel requirements for the unified signal(s). Such unified communication and navigation signals will have the potential to reduce the system design complexities across several segments of the system (such as the transmitter, receiver, the control/base station) eventually resulting in energy efficient and cost effective solutions.

ACSER and the Garada Project will be providing scholarships for some students. All prospective students should, however, apply for:

- Australian Postgraduate Award (APA; for Australian citizens) OR an
- International Postgraduate Research Scholarship (IPRS; International students).

Suitability for the ACSER and Garada scholarships will be assessed in the same way as applicants for APA and IPRS. For more information about these scholarships please go to

<http://research.unsw.edu.au/postgraduate-research-scholarships>.

Further Information on the project may be obtained from Nagaraj Shivaramaiah
(nagaraj@unsw.edu.au).