

Defence and Security Application Research Center: PhD Funding at UNSW@ADFA

Ph.D. in Electrical Engineering, University of New South Wales at Australian Defence Force Academy, Canberra.

Stipend: AUD 20,431 per annum for 3 years.

Title: Surveillance Automation - Advanced Statistical Inference for Change Detection using Remotely Sensed Images

Abstract:

The ability to detect change, including subtle change, is critical to many activities including surveillance. With rapidly increasing data volumes due to higher resolution and more frequent imaging, more automated procedures are necessary. On the other hand, the high spatial, spectral and temporal resolution data opens up an opportunity for regularly quantitative change monitoring. The challenge is how to convert data into required information via signal analysis techniques.

While many statistical and heuristic methods are available for analysis of remote sensing imagery the leading edge of statistical inference is in the use of Minimum Message Length, or MML. MML is a theoretically robust approach to inference with a basis in information theory and Bayes Theorem. MML has been demonstrated to be superior to other methods on theoretical and performance grounds for a range of research problems. However penetration of MML into more applied research has been slow because the techniques are computationally intensive and mathematically difficult. The investigation and development on this advanced method are the focus of this PhD project.

The research outcomes include the development and implementation of MML methods together with a comprehensive comparison of MML methods for the detection of specific changes in the landscape with more traditional image analysis methods. The success of this project is significant in maximizing information extraction, in particular, for the applications in automated surveillance.

Essential Skills: Statistics and data analysis skills, image processing and computing experience

Preferred Skills: Remote sensing knowledge

Requirement: Must meet UNSW PhD Admission Requirements and should be able to join in Session 1, 2007.

Contact:

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Last Date: January 15, 2007. The search might be terminated early if an appropriate candidate is found earlier.