The Discipline of Business Analytics in the University of Sydney Business School is offering Research Internships for undergraduate and postgraduate students who can work for a period between 6-8 weeks sometime during the period of December 2017, January and February, 2018. This internship aims to give you the opportunity to work alongside top researchers in Business Analytics, and will be particularly valuable if you are considering the possibility of honours or PhD study in the future. There are three research projects available (see below).

These projects are suitable for students (at any university) who have completed a minimum of 2 years undergraduate study in Business, Economics, Engineering, Computer Science or Mathematics; or equivalent level of study at a postgraduate level.

**Payment while an intern**
As an intern you have the status of being a student. The appointment is primarily for your benefit – so that you can deepen your skills in quantitative research. The Discipline has the capacity to pay you as a part-time Research Assistant (RA HEO Level 3, Step 1).

**Project Outlines:**

**Boris Choy**

**Project 1:** Big Data Analytics of the Australian Health Surveys (Boris Choy & Simon Poon, Faculty of IT)

This project aims to extract important health information from the Australian National Health Surveys. Based on the survey data collected over many years, a data repository will be built first. Then we consider longitudinal aspects of the data for model building and combine statistical and computational data analytic approaches to explore interesting patterns in the surveys. The research findings results may be useful for health planning. [http://www.abs.gov.au/australianhealthsurvey](http://www.abs.gov.au/australianhealthsurvey)

**Project 2:** Big Data Analytics of the Australian taxation data (Boris Choy)

This project aims to use various big data analytic techniques to draw reliable inference on individual tax return data collected by the Australian Taxation Office. In particular, the project focuses on studying the time-dependent structure of a number of ratios, such as related-related deduction-to-income ratio for different professions. We aim to detect the professions that tend to have a high work-related deduction-to-income ratio and investigate possible tax avoidance and evasion. Unreported income and tax evasion should not
be tolerated and heavy penalty should be imposed.

**Minh Ngoc Tran**

**Time series forecasting with Deep Learning**

This project aims at developing efficient methodologies for time series forecasting with deep neural networks. Time series analysis is one of the oldest and most established areas in statistics but focuses mainly on linearity effects, while deep learning is a relatively new and exciting area that provides flexible methods for accurate functional approximation.

This project will combine the strength of the two fields, together with recent advances in Bayesian computation, to develop efficient methods for accurate forecasting.

**Semiparametric Estimation of Copula Based Models**

This project looks at alternative ways of obtaining precise and robust estimates in multivariate models using copula functions. Copulas are functions that generalise correlation to more advanced dependence structures, of primary use in finance and insurance. The project will involve programming in Matlab/R and theoretical derivations of asymptotic distributions.

This advanced topic will give students the edge in state-of-the-art multivariate modelling, which could serve as a stepstone to an honours or a PhD thesis.

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**For more information**

[coleen.liu@sydney.edu.au](mailto:coleen.liu@sydney.edu.au)

**How to apply**

Applications should be sent by email to Colleen Liu at [coleen.liu@sydney.edu.au](mailto:coleen.liu@sydney.edu.au) by 9am on **Friday 24 November**. Your application should consist of:

(a) A one-page curriculum vitae. You need to mention any skills or experience you have that may be relevant (e.g. programming languages, statistical skills)

(b) A copy of your academic transcript

(c) The projects for which you wish to be considered (in order of preference), and why

(d) The dates for which you are available to work on the project.

You will be told whether you have been successful by email before **Friday 8 December**.

**Closing date**

9am Friday 24 November