

Application for participation at the Doctoral Forum

Last name: Finch

First name: Adam

Institutional affiliation (university/department/link to website): Swinburne University, Centre for Transformative Innovation, <http://www.swinburne.edu.au/business-law/research/transformative-innovation/>

Full address of the doctoral student including phone and fax numbers and email address:

Adam Finch,
CSIRO, Building 1,
Gate 4, Waite Road,
Urrbrae,
SA 5064,
Australia

Adam.finch@csiro.au

00 61 8 8273 8105

00 61 4 1373 5942

Names of the supervisor(s) (links to their websites): Russell Thomson

<http://www.swinburne.edu.au/business-law/staff-profiles/view.php?who=russellthomson>

(in total max 1500 words)

Description of doctoral research project (including research questions, theoretical background, planned methodology, current status)

The aim is to produce an accurate and comprehensive study of the collaboration on scholarly publications occurring in Australia and its research institutions as well as a selection of other countries.

International collaboration – as measured by the co-authorship of research publications - is commonly seen as both a driver and an indicator of academic impact, and is increasingly an element measured in research evaluation. Science Metrix, Snowball Metrics, the CWTS in Leiden and the recent STEM benchmarking report by Australia's Office of the Chief Scientist all provide analysis of international collaboration.

Such analysis is often skewed by the fact that different subjects involve international collaboration with different frequency. Without accounting for this, comparison of institutions or countries publishing more, for example, radio astronomy (which sees very frequent international collaboration) as opposed to religion or history (which do not) are deeply misleading. So too are resultant conclusions about citation advantage conferred by collaboration.

The project will therefore apply a novel indicator of my own creation (the Normalised International Collaboration Score) to publication records to adjust for these variables, will analyse patterns in international and partner-country-specific collaboration and will consider the advantage in academic impact – as measured by citations – yielded by such collaboration. The intended result is the first robust view of the extent and nature of international research publication collaboration in the early 21st Century.

Initial work – submitted as a Research in Progress to ISSI 2015 – confirms that the average number of countries contributing to publications is strongly influenced by the age of the publication, with more recent publications seeing more frequent collaboration. The subject of the work has a great influence too, though the distribution of collaboration frequency is entirely dissimilar to the subject distribution of citation frequency; some areas of medicine see substantial collaboration and others none at all, while social sciences subjects in many cases involve more international collaboration than science subjects. Lastly, it was found that publication type also had a strong influence on collaboration; though this varied by subject area, with articles sometimes more collaborative and sometimes reviews, proceedings papers were found to seldom involve any international collaboration. The pilot study involved the creation of global average baselines representing the mean number of contributing countries for publications of the same year, subject(s) and type. The number of contributing countries for each article in a set is then divided by the relevant baseline to yield a ratio, the median of which is then taken as the NICS for that set.

Original work to construct the requisite baselines for the novel indicator is already underway. The full study will include all subjects in the sciences and social sciences as well as those in the arts and humanities where a sufficient proportion of publications are found to include address data. Depending on the application of license terms and data availability, the years covered will either be the most recent three and a number of individual years going back to the late 1990s (before which address data coverage was very patchy) or all years going back to 1996. It is hoped that all publication types will be included, though this will be subject to address data coverage. It is also hoped that patents will form a part of the analysis, though this will be subject to verification that country information can be reliably extracted in sufficient proportions for statistically meaningful baselines.

Existing data records for Australia and other countries' records downloaded from Web of Science will be analysed for the frequency and intensity of international collaboration (i.e. how often collaboration occurs and with how many institutions), relative to world baselines. Performance will be compared using the new and traditional indicators and collaboration levels correlated with robust measures of citation performance (i.e. Normalised Citation Impact and Citation Percentile Thresholds).

Beyond a headline comparison of Australia's collaboration levels with that of other countries, a number of additional questions will be answered, including a view of Australia's collaboration strength at a subject and field level; analysis at an institutional level, highlighting those parts of the national innovation system that are more or less internationally engaged; and detailed analysis of the evolving natures of the partnerships Australia and its institutions have, in terms of which countries are partners and which sectors the collaboration institutions belong to.

At present, I have only just been accepted at Swinburne; my studies are set to commence in March. The validity and information content of the NICS metric have been provisionally established, though it is expected that further work on this novel metric will be published with myself as lead author. By the time of the ISSI 2015 conference, I expect to have my research questions established and the raw data for the research acquired and processed.

Motivation for student participation at the Doctoral Forum and the issues you wish to receive feedback on from the senior researchers.

At the time of the ISSI 2015 conference, I would have established my research questions and acquired then processed the raw publication records. My attendance of the Doctoral Forum would therefore be extremely useful, for several reasons.

Firstly, my PhD is, nominally at least, by Practice Based Research and my supervisor an economist and econometrician rather than a bibliometrician. I expect to have a panel of co-supervisors from Australia and, informally, abroad, which will include bibliometricians. However, it would be invaluable to have a sense check from other senior researchers on whether my topic is appropriately broad and deep for a PhD, since my thesis will be externally examined by such researchers.

Beyond this verification and guidance, the Doctoral Forum would allow me to sense-check my research questions and, most crucially, provide guidance as to whether there were additional aspects of the NICS metric that needed testing, or potential modifications that could strengthen it. It is in this regard that the Forum would be most useful, as I have no experience of testing a novel indicator; the senior researchers, clearly, do.

The timing of the Doctoral Forum is therefore perfect; my work is at an early enough stage that any core issues with the metric upon which it is based and the approach taken in the wider analysis can be identified and fixed.