An assessment of systems and software engineering scholars and institutions (2003–2007 and 2004–2008)*

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ABSTRACT

An ongoing, annual survey of publications in systems and software engineering identifies the top 15 scholars and institutions in the field over a 5-year period. Each ranking is based on the weighted scores of the number of papers published in *TSE*, *TOSEM*, *JSS*, *SPE*, *EMSE*, *IST*, and *Software* of the corresponding period. This report summarizes the results for 2003–2007 and 2004–2008. The top-ranked institution is Korea Advanced Institute of Science and Technology, Korea for 2003–2007, and Simula Research Laboratory, Norway for 2004–2008, while Magne Jørgensen is the top-ranked scholar for both periods.

Keywords: Top scholars, top institutions, systems and software engineering, research publications

1. Introduction

Glass (1994) published the first annual survey report to answer two interesting questions:

- Who are the most published scholars in the field of systems and software engineering for the last 5 years?
- Which are the most published institutions?

Based on a 1991 survey of the editorial board of the *Journal of Systems and Software*, a ranking formula was devised, taking into account the number of papers

published by each individual scholar and institution, respectively, in the following six leading systems and software engineering journals:

- *IEEE Transactions on Software Engineering* (*TSE*), IEEE Computer Society
- *ACM Transactions on Software Engineering and Methodologies* (*TOSEM*), ACM
- *Journal of Systems and Software* (*JSS*), Elsevier Science
- *Software: Practice and Experience* (*SPE*), John Wiley & Sons
- *IEEE Software* (*SW*), IEEE Computer Society
- *Information and Software Technology* (*IST*), Elsevier Science

Repeated annually, the same set of journals and ranking formula was used until the period of 2002–2006, when an additional Journal, *Empirical Software Engineering* (*EMSE*), published by Springer, was also included (Wong et al., 2009). This addition was intended to emphasize the importance of applied software engineering research with a strong empirical component. Only those *EMSE* publications dated from 2006 onwards were considered; those from 2003 to 2005 were excluded to avoid disturbing the results of previously published reports covering these years.

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This study provides a quantitative, repeatable, and comprehensible way to evaluate the performance of research institutions and their scholars in the realms of academia, government, and industry. In addition, since these are the 14th (2003–2007) and 15th (2004–2008) in the series, it allows a comparison to show how the ranking of one institution changes from a period to another, which (along with other factors) can be used as a reference for future support from sponsors or as an indicator for attracting future employees.

We emphasize that there are other evaluation criteria based on either objective data or subjective surveys. For example, some universities in USA use research funding and weighted school credit hours (such that a credit hour for a graduate course receives a higher weight than a credit hour for an undergraduate course because of higher matching funds for the former from the state government) as the sole evaluation metric. One significant drawback of such an approach is that it treats research as commodity, measured only in terms of its current monetary value.

Some critics of our evaluation method believe that correctness, importance, novelty, and overall contribution of each paper should be given greater consideration than the number of publications (Parnas, 2007). However, an assessment on these grounds will certainly be influenced by subjective factors such as the competence or bias of the reviewer (Meyer et al., 2009), and the time investment required to adequately review each paper significantly limits the number of publications that can be included in a survey. Citation counting has been proposed as an enhancement to publication counting, although Parnas (2007) observed that a citation might well imply a negative critique or simply a neutral reference as part of a general summary of related work. While the development of a more comprehensive and accurate metric for the assessment of researchers and institutions is a worthwhile goal, the rankings provided by publication counting can still be useful (Geist et al., 1996).

In a memo published in 1999, Patterson et al. (1999) recognized conference publications as the primary means of publication in computer science and engineering research. Since then, the emphasis of conference publications over journals has increased. This has generated many contentious discussions. For example, Vardi in his *Communication of the ACM* (*CACM*) article (Vardi, 2009) raised the question "whether we are driving on the wrong side of the publication road." He also expressed his concerns with the peer-review process because conference reviews were done by program committees under extreme time and workload pressures. In addition, he reported that only a small fraction of conference papers are followed by journal papers. In a follow-up article also appearing in *CACM* in 2009, Fortnow (2009) shared the same concern by saying "two or three careful journal referee reports give a much more detailed level of review than four or five rushed evaluations of conference reviewers." He further proposed that hiring and promotion should be based more on journal publications than conference publications. While the debate continues, we would like to clarify that the exclusion of conference proceedings from our report is the result of an academic decision, and not due to the limitations of the manual process as described by Ren and Taylor (2007). Another potential threat to the validity of our study is the journals included in the survey. While it is possible that a different set of journals (or conferences) may produce different rankings for both top scholars and institutions, our results are still representative given that all seven journals selected are widely recognized by the research community.

In summary, we restrict ourselves to the field of systems and software engineering, rather than expanding the study to include the whole of computer science or information systems. We do not claim that publication-based ranking is the only meaningful evaluation mechanism, but only that it provides some quantitative guidance toward answering the two questions raised at the beginning of this report.

The rest of the paper is organized as follows: Section 2 reports our findings on the top scholars, including a comparison among the periods of 2001–2005, 2002–2006, 2003–2007, and 2004–2008. Section 3 gives the findings and comparisons on the top institutions. The correlation between top scholars and institutions is examined in Section 4.

2. Top scholars

The top scholars in the field are shown in Table 1 and Table 2. For the period of 2003–2007, the scores, based on their publication history in the seven journals, range from 12.40 to 4.20, whereas the range is from 13.30 to 4.20 for 2004–2008.

We have four ties in the 2003–2007 ranking at the 5th, 9th, 11th and 15th places with two scholars for each tie. This brings the total to 16 top scholars. Similarly, the ties for 2004–2008 are two scholars at the 5th and 8th places, respectively, and three at the 13th place. There are 15 top scholars all together. Geographically, for 2003–2007, eight scholars are from Europe, five from the Asia-Pacific region (including Australia), and three from North America (USA and Canada). The distribution for 2004–2008 is along the same lines: seven from Europe, five from the Asia-Pacific region, and three from North America. In both periods, there are more top scholars from Europe than the other two regions. This is very different from 2001–2005 and 2002–2006, where Europe is ranked the second among the three regions. With respect to

individual countries, Norway has the highest number of top scholars (three) for 2003–2007, followed by Taiwan, Sweden, UK, and USA with two scholars each. A similar distribution with a slight change is also observed for 2004–2008 with Taiwan having the highest number of top scholars (three), followed by Norway, UK, and USA with two scholars each.

Magne Jørgensen from Simula Research Laboratory, Norway is in first place for both 2003–2007 and 2004–2008. Additionally, he was also ranked number one for 2001–2005 and 2002–2006. Shih-Chien Chou from National Dong Hwa University, Taiwan is the runner-up for both 2003–2007 and 2004–2008. He is at the third place for 2002–2006 and the fourth place for 2001–2005.

Table 1. Top scholars in the field of systems and software engineering (2003–2007)

Rank	Scholar	Institution	Scores of each journal							Total score
			TSE	TOSEM	SPE	JSS	IST	SW	EMSE	
1	Magne Jørgensen	Simula Research Laboratory, Norway	4.80	0.00	0.00	3.20	2.90	1.50	0.00	12.40
2	Shih-Chien Chou	National Dong Hwa University, Taiwan	0.00	0.00	0.00	5.40	2.50	0.00	0.00	7.90
3	Hai Zhuge	Chinese Academy of Sciences, China	0.00	0.00	0.00	7.80	0.00	0.00	0.00	7.80
4	Per Runeson	Lund University, Sweden	1.90	0.00	0.00	0.60	0.00	2.50	0.70	5.70
5	Lionel Briand,	Simula Research Laboratory, Norway	3.40	0.00	0.50	0.80	0.80	0.00	0.00	5.50
5	Barbara Kitchenham	Keele University, UK	1.80	0.00	0.00	0.90	0.80	1.70	0.00	5.20
7	Robyn R. Lutz	Iowa State University, USA	0.70	0.00	0.70	2.90	0.00	0.70	0.00	5.00
8	Chin-Yu Huang	National Tsing-Hua University, Taiwan	0.50	0.00	0.00	4.40	0.00	0.00	0.00	4.90
9	Claes Wohlin	Blekinge Institute of Technology, Sweden	0.50	0.00	0.70	1.10	0.70	0.80	1.00	4.80
9	Mark Harman	King's College London, UK	2.10	0.50	0.60	0.80	0.80	0.00	0.00	4.80
11	James Miller	University of Alberta, Canada	0.70	0.00	0.00	1.30	2.00	0.00	0.60	4.60
11	Dag I. K. Sjøberg	University of Oslo, Norway	1.80	0.00	0.00	0.50	2.00	0.00	0.30	4.60
13	Chin-Wan Chung	Korean Advanced Institute of Science & Technology, Korea	0.00	0.00	0.00	1.70	2.70	0.00	0.00	4.40
14	Jeff Tian	Southern Methodist University, USA	1.20	0.00	0.00	1.40	0.00	1.70	0.00	4.30
15	Richard Lai	La Trobe University, Australia	1.40	0.00	0.00	1.30	1.50	0.00	0.00	4.20
15	Alexander Chatzigeorgiou	University of Macedonia, Greece	1.80	0.00	0.00	0.00	2.40	0.00	0.00	4.20

Table 2. Top scholars in the field of systems and software engineering (2004–2008)

Rank	Scholar	Institution	Scores of each journal							Total score
			TSE	TOSEM	SPE	JSS	IST	SW	EMSE	
1	Magne Jørgensen	Simula Research Laboratory, Norway	5.50	0.70	0.00	2.70	2.20	2.20	0.00	13.30
2	Shih-Chien Chou	National Dong Hwa University, Taiwan	0.00	0.00	0.00	5.40	2.50	0.00	0.00	7.90
3	Hai Zhuge	Chinese Academy of Sciences, China	0.00	0.00	0.00	6.80	0.00	0.00	0.00	6.80
4	Lefteris Angelis	University of Thessaloniki, Greece	0.50	0.00	0.00	2.70	1.80	0.00	1.00	6.00
5	Lionel Briand	Simula Research Laboratory, Norway	3.40	0.00	0.00	1.30	0.80	0.00	0.00	5.50
5	Barbara Kitchenham	Keele University, UK	1.70	0.00	0.00	0.90	0.80	1.00	1.10	5.50
7	Chin-Yu Huang	National Tsing-Hua University, Taiwan	0.00	0.00	0.00	5.10	0.00	0.00	0.00	5.10
8	Chin-Chen Chang	National Chung Cheng University, Taiwan	0.00	0.00	0.00	5.00	0.00	0.00	0.00	5.00
8	Atif M. Memon	University of Maryland, USA	2.00	2.40	0.00	0.00	0.00	0.30	0.30	5.00
10	Chin-Wan Chung	Korean Advanced Institute of Science & Technology, Korea	0.00	0.00	0.00	2.40	2.50	0.00	0.00	4.90
11	Mark Harman	King's College London, UK	1.80	0.50	0.60	0.60	1.10	0.00	0.00	4.60
12	James Miller	University of Alberta, Canada	0.70	0.00	0.00	1.00	2.00	0.00	0.60	4.30
13	Hans van Vliet	Vrije Universiteit, Netherlands	0.00	0.00	0.00	3.20	0.00	1.00	0.00	4.20
13	Amrit Tiwana	Iowa State University, USA	0.00	1.00	0.00	0.00	1.50	1.70	0.00	4.20
13	Mario Piattini	University of Castilla-La Mancha, Spain	0.00	0.00	0.30	0.60	2.30	0.70	0.30	4.20

Table 3. Top-scholar ranking for four consecutive survey periods

Scholar	Institution	2004–2008	2003–2007	2002–2006	2001–2005
Magne Jørgensen	Simula Research Laboratory, Norway	1	1	1	1
Shih-Chien Chou	National Dong Hwa University, Taiwan	2	2	3	4
Hai Zhuge	Chinese Academy of Sciences, China	3	3	2	2
Lefteris Angelis	University of Thessaloniki, Greece	4	–[†]	–	–
Lionel Briand	Simula Research Laboratory, Norway	5	5	4	4
Barbara Kitchenham	Keele University, UK	5	5	5	2
Chin-Yu Huang	National Tsing-Hua University, Taiwan	7	8	14	–
Chin-Chen Chang	National Chung Cheng University, Taiwan	8	–	15	–
Atif M. Memon	University of Maryland, USA	8	–	–	–
Chin-Wan Chung	Korean Advanced Institute of Science and Technology, Korea	10	13	7	8
Mark Harman	King's College London, UK	11	9	–	14
James Miller	University of Alberta, Canada	12	11	9	10
Hans van Vliet	Vrije Universiteit, Netherlands	13	–	–	–
Amrit Tiwana	Iowa State University, USA	13	–	–	–
Mario Piattini	University of Castilla-La Mancha, Spain	13	–	–	–
Per Runeson	Lund University, Sweden	–	4	5	–
Robyn R. Lutz	Iowa State University, USA	–	7	–	–
Claes Wohlin	Blekinge Institute of Technology, Sweden	–	9	8	–
Dag I. K. Sjøberg	University of Oslo, Norway	–	11	–	–
Jeff Tian	Southern Methodist University, USA	–	14	12	7
Richard Lai	La Trobe University, Australia	–	15	10	–
Alexander Chatzigeorgiou	University of Macedonia, Greece	–	15	–	–
Ioannis Stamelos	Aristotle University of Thessaloniki, Greece	–	–	11	12
Myoung-Ho Kim	Korean Advanced Institute of Science and Technology, Korea	–	–	13	9
Jan Bosch	Intuit, USA	–	–	15	13
T. Y. Chen	Swinburne University of Technology, Australia	–	–	–	6
Hyoung-Joo Kim	Seoul National University, Korea	–	–	–	10
Khaled El Emam	University of Ottawa, Canada	–	–	–	14
Robert L. Glass	Computing Trends	–	–	–	14

† The notation "–" means "not present on the list".

Referring to Table 3, we observe that six scholars on the list for 2004–2008 are not in 2003–2007. This is the widest variation in recent surveys when compared with four in 2003–2007 but not 2002–2006, five in 2002–2006 but not 2001–2005, and four in 2001–2005 but not 2000–2004.

Some notable advancements in 2004–2008 are made by Lefteris Angelis from University of Thessaloniki, Greece at the 4th place, followed by Chin-Chen Chang from National Chung Cheng University, Taiwan and Atif Memon from University of Maryland, USA, both at 8th while neither appear in 2003–2007.

In 2003–2007, the most advancement was made by Chin-Yu Huang from National Tsing-Hua University, Taiwan at the 8th place from 14th in 2002–2006, reaching 7th in 2004–2008. Others include Mark Harman from King's College London, UK[1] at the 9th place while not on the list for 2002–2006 and remained at 11th in 2004–2008; Robyn Lutz from Iowa State

University, USA at 7th, Dag Sjøberg from University of Oslo, Norway at 11th, and Alexander Chatzigeorgiou from University of Macedonia, Greece at 15th while not on the list for 2002–2006, but they are dropped from the rankings in 2004–2008.

Table 1 and Table 2 also show the score with respect to each journal for each scholar. The most missed journals are SPE (12 out of 16 for 2003–2007 and 13 out of 15 for 2004–2008) and TOSEM (15 out of 16 for 2003–2007 and 11 out of 15 for 2004–2008). The least is JSS (1 out of 16 for 2003–2007 and 2 out of 15 for 2004–2008). The data on *EMSE* should not be misinterpreted because, as explained in Section 1, only the publications of that journal from 2006 onwards are included.

Table 4 provides the key words that best describe the research interests of each top scholar. Software testing is the most frequent key word, followed by metrics.

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[1] Mark Harman moved from King's College London to University College London in August 2010.

3. Top institutions

The top 15 institutions in the field are shown in Table 5 and Table 6. The scores, based on their publication history in the seven journals we surveyed, range from 28.29 to 11.32 for 2003–2007 and 31.70 to 11.29 for 2004–2008. Unlike the top scholars, there is no tie for the institution-based rankings. All the top institutions except Simula Research Laboratory, IBM T. J. Watson Research Center and National ICT of Australia are from academia.

Geographically, for 2003–2007 six of the institutions are from the Asia-Pacific region (including Australia), five from North America (USA and Canada), and four from Europe. The distribution for 2004–2008 becomes even more skewed toward the Asia-Pacific region (eight), with only two from Europe. The remaining five are from North America. This clearly

shows a significant disparity between Asia-Pacific and Europe as the former has four times as many top institutions as the latter. It also leads to another interesting observation: Although Europe has more top scholars than the other two regions (as described in Section 2), it has the least number of top institutions. With respect to individual countries, USA has the highest number of top institutions (three) for 2003–2007, followed by Sweden, Taiwan, Korea, and Canada with two institutions each. USA is also in first place for 2004–2008 with four institutions, followed by Australia (three), Taiwan (two), and Korea (two). However, USA has only two top scholars in 2003–2007 and 2004–2008. These observations raise an important question, "What is the correlation between top scholars and top institutions?" to be addressed in Section 4.

Table 4. Research focus of top scholars on the 2003–2007 and 2004–2008 lists[†]

Scholar	Research Focus
Lefteris Angelis	statistical methods, software metrics, software management
Lionel Briand	software testing, model-driven engineering
Chin-Chen Chang	data engineering, database systems, computer cryptography, information security
Alexander Chatzigeorgiou	object-oriented design, software maintenance, metrics
Shih-Chien Chou	information flow control, software reuse, web service related topics (e.g., path reuse, path re-planning, security assurance)
Chin-Wan Chung	database, web, multimedia
Mark Harman	search based software engineering, software testing
Chin-Yu Huang	software reliability, software testing, software metrics
Magne Jørgensen	judgment-based effort estimation
Barbara Kitchenham	empirical methods, evidence-based software engineering, metrics, cost estimation
Richard Lai	software process improvement, software measurement and testing, requirements engineering, component-based software engineering, human centered computing
Robyn R. Lutz	product lines, software safety, requirements engineering, fault diagnosis and recovery
Atif M. Memon	software testing, model-based automated testing, GUI testing, benchmarking for testing, event-driven software, web testing
James Miller	web engineering, verification and validation, security and privacy
Mario Piattini	information systems quality
Per Runeson	empirical software engineering, testing, inspections, software quality management
Dag I. K. Sjøberg	empirical and evidence-based software engineering, software quality, software process
Jeff Tian	testing and quality improvement, measurement and risk management, net-centric and web-based software and systems
Amrit Tiwana	systems development, project management, control and governance, modularity
Hans van Vliet	software architecture, quantitative aspects of software engineering
Claes Wohlin	empirical software engineering, software management, software process, requirements engineering
Hai Zhuge	internet-based systems

[†] Researchers are listed in alphabetical order of their last names.

In 2003–2007, Korea Advanced Institute of Science and Technology (KAIST) tops the ranking with a score of 28.29 and Simula Research Laboratory in Norway as the second with a score of 28.04. This order is reversed in 2004–2008, where Simula is the first (31.70) and KAIST is the second (26.70).

Regarding the variation between recent surveys (see Table 7), there are four institutions on the list for 2004–2008 but not in 2003–2007, whereas only three institutions appear in 2003–2007 but not 2002–2006, two in 2002–2006 but not 2001–2005, and three in 2001–2005 but not 2000–2004. The change in 2004–2008 is the most significant among these four periods,

which is consistent with the observation for the top scholars.

Some notable advancements in 2004–2008 were made by National ICT Australia, Australia (5th place), IBM T. J. Watson Research Center, USA (8th place), University of New South Wales, Australia (9th place) and Swinburne University of Technology, Australia (13th place), which had not appeared on any of the recent lists. In 2003–2007, the most advancement was made by Blekinge Institute of Technology, Sweden from 11th in 2002–2006 to 5th and remained at 6th in 2004–2008. Others include Carleton University, Canada at the 8th place but not listed in 2002–2006, falling to 14th in 2004–2008; Lund University, Sweden and University of Alberta, Canada at the 10th and 14th places after not being listed in 2002–2006, but they fell off the rankings in 2004–2008.

With respect to each journal, 13 of the 15 institutions did not have any publications in *TOSEM* in 2003–2007 and eight did not have publications in *Software*. Only one (University of Maryland) had publications in all seven journals. In 2004–2008, the two most missed journals are still *TOSEM* (ten institutions) and *Software* (six institutions). Two institutions (University of Maryland and IBM T. J. Watson Research Center) had publications in all seven journals. All 15 top institutions have publications in *JSS* and *IST*.

The data on *EMSE* should not be misinterpreted because only the publications of this journal from 2006 onwards are included.

Table 5. Top institutions in the field of systems and software engineering (2003–2007)

Rank	Institute	Journals in which published	Score
1	Korea Advanced Institute of Science and Technology, Korea	All but *TOSEM*, *SW*, and *EMSE*	28.29
2	Simula Research Laboratory, Norway	All but *TOSEM* and *SPE*	28.04
3	National Chiao Tung University, Taiwan	All but *TOSEM*, *TSE*, *SW*, and *EMSE*	21.74
4	University of Maryland, USA	All	20.71
5	Blekinge Institute of Technology, Sweden	All but *TOSEM*	15.52
6	Hong Kong Polytechnic University, Hong Kong	All but *TOSEM*, *SW*, and *EMSE*	14.97
7	National Cheng Kung University, Taiwan	All but *TOSEM*, *SW*, and *EMSE*	14.70
8	Carleton University, Canada	All but *TOSEM* and *EMSE*	13.25
9	Seoul National University, Korea	All but *TOSEM*, *TSE*, *SW*, and *EMSE*	12.96
10	Lund University, Sweden	All but *TOSEM* and *SPE*	12.63
11	Aristotle University of Thessaloniki, Greece	All but *TOSEM*, *TSE*, *SPE*, and *SW*	12.54
12	Iowa State University, USA	All but *EMSE*	12.46
13	University of Texas at Dallas, USA	All but *TOSEM* and *EMSE*	12.43
14	University of Alberta, Canada	All but *TOSEM* and *SW*	11.49
15	Chinese Academy of Sciences, China	All but *TOSEM*, *TSE*, SPE, *SW*, and *EMSE*	11.32

Table 6. Top institutions in the field of systems and software engineering (2004–2008)

Rank	Institute	Journals in which published	Score
1	Simula Research Laboratory, Norway	All but *SPE*	31.70
2	Korea Advanced Institute of Science and Technology, Korea	All but *TOSEM*, *SW*, and *EMSE*	26.70
3	University of Maryland, USA	All	23.85
4	National Chiao Tung University, Taiwan	All but *TOSEM*, *TSE*, *SW*, and *EMSE*	23.82
5	National ICT Australia, Australia	All but *TOSEM*	17.83
6	Blekinge Institute of Technology, Sweden	All but *TOSEM*	17.23
7	National Cheng Kung University, Taiwan	All but *TOSEM*, *TSE*, *SW*, and *EMSE*	14.53
8	IBM T. J. Watson Research Center, USA	All	14.51
9	University of New South Wales, Australia	All but *TOSEM*	14.15
10	University of Texas at Dallas, USA	All but *TOSEM* and *EMSE*	13.35
11	Hong Kong Polytechnic University, Hong Kong	All but *TOSEM*, *SW*, and *EMSE*	13.30
12	Iowa State University, USA	All but *EMSE*	12.07
13	Swinburne University of Technology, Australia	All but *TSE*, *SPE*, *SW*, and *EMSE*	11.97
14	Carleton University, Canada	All but *TOSEM* and *EMSE*	11.41
15	Seoul National University, Korea	All but *TOSEM*, *TSE*, *SW*, and *EMSE*	11.29

Table 7. Top-institution ranking for four consecutive survey periods

Institution	2004–2008	2003–2007	2002–2006	2001–2005
Simula Research Laboratory, Norway	1	2	2	3
Korea Advanced Institute of Science and Technology, Korea	2	1	1	1
University of Maryland, USA	3	4	4	11
National Chiao Tung University, Taiwan	4	3	3	2
National ICT Australia, Australia	5	–[†]	–	–
Blekinge Institute of Technology, Sweden	6	5	11	–
National Cheng Kung University, Taiwan	7	7	8	15
IBM T. J. Watson Research Center	8	–	–	–
University of New South Wales, Australia	9	–	–	–
University of Texas at Dallas, USA	10	13	10	9
Hong Kong Polytechnic University, Hong Kong	11	6	6	10
Iowa State University, USA	12	12	9	7
Swinburne University of Technology, Australia	13	–	–	–
Carleton University, Canada	14	8	–	–
Seoul National University, Korea	15	9	5	4
Lund University, Sweden	–	10	–	–
Aristotle University of Thessaloniki, Greece	–	11	7	13
University of Alberta, Canada	–	14	–	–
Chinese Academy of Science, China	–	15	13	–
City University of Hong Kong, Hong Kong	–	–	11	8
National University of Singapore, Singapore	–	–	14	14
Georgia Institute of Technology, USA	–	–	15	6
Carnegie Mellon University/SEI, USA	–	–	–	5
Microsoft, USA	–	–	–	12

[†] The notation "–" means "not present on the list".

Table 8 Top institutions and top scholars (2003 –2007)

Rank	Institute	Top Scholar
1	Korea Advanced Institute of Science and Technology, Korea	Chin-Wan Chung (13)[†]
2	Simula Research Laboratory, Norway	Magne Jørgensen (1), Lionel Briand (5)
3	National Chiao Tung University, Taiwan	
4	University of Maryland, USA	
5	Blekinge Institute of Technology, Sweden	Claes Wohlin (9)
6	Hong Kong Polytechnic University, Hong Kong	
7	National Cheng Kung University, Taiwan	
8	Carleton University, Canada	
9	Seoul National University, Korea	
10	Lund University, Sweden	Per Runeson (4)
11	Aristotle University of Thessaloniki, Greece	
12	Iowa State University, USA	Robyn R. Lutz (7)
13	University of Texas at Dallas, USA	
14	University of Alberta, Canada	James Miller (11)
15	Chinese Academy of Sciences, China	Hai Zhuge (3)

[†] The number in the parentheses is the ranking of the top scholar.

4. Correlation between top institutions and top scholars

We have also analyzed the relationship between the ranking of an institution and the number of top scholars housed there, the results of which are shown in

Table 8 and Table 9. Of the 15 institutions, seven in 2003–2007 and four in 2004–2008 had at least one top scholar. Simula Research Laboratory currently houses two top scholars: Magne Jørgensen (1st place) and Lionel Brand (5th place).[2] As discussed in Section 3, although top scholars can improve an institution's score, it is not necessarily the only deciding factor in achieving a high ranking.

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[2] Only Magne Jørgensen was employed at Simula during the 2003–2007 and 2004–2008 periods under consideration.

Table 9 Top institutions and top scholars (2004–2008)

Rank	Institute	Top Scholar
1	Simula Research Laboratory, Norway	Magne Jørgensen (1),[†] Lionel Briand (5)
2	Korea Advanced Institute of Science and Technology, Korea	Chin-Wan Chung (10)
3	University of Maryland, USA	Atif M. Memon (8)
4	National Chiao Tung University, Taiwan	
5	National ICT Australia, Australia	
6	Blekinge Institute of Technology, Sweden	
7	National Cheng Kung University, Taiwan	
8	IBM T. J. Watson Research Center	
9	University of New South Wales, Australia	
10	University of Texas at Dallas, USA	
11	Hong Kong Polytechnic University, Hong Kong	
12	Iowa State University, USA	Amrit Tiwana (13)
13	Swinburne University of Technology, Australia	
14	Carleton University, Canada	
15	Seoul National University, Korea	

[†]The number in the parentheses is the ranking of the top scholar.

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