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An assessment of systems and software engineering scholars and institutions (2001–2005)[☆]

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Abstract

This paper presents the findings of a five-year study of the top scholars and institutions in the systems and software engineering field, as measured by the quantity of papers published in the journals of the field in 2001–2005. The top scholar is Magne Jørgensen of Simula Research Laboratory, Norway, and the top institution is Korea Advanced Institute of Science and Technology, Korea.

This paper is part of an ongoing study, conducted annually, that identifies the top 15 scholars and institutions in the most recent five-year period.

Key words: Top scholars; Top institutions; Research publications; Systems and software engineering

1. Introduction

Who are the most published scholars in the field of systems and software engineering (SSE)? Which are the most published institutions?

This paper is the twelfth in an annual series whose goal is to answer these questions. The first such paper was Glass (1994); subsequently such studies have been published each year. The last report can be found in Tse et al. (2006).

This is the eighth survey that includes five years' worth of data. This paper reports on the top scholars and institutions for the five-year period 2001–2005.

It is important to note two things at the outset:

- (a) The study findings are based on the frequency of publication in the leading journals in the SSE field.
- (b) The study focuses on the field of SSE, and not, for example, on computer science or information systems.

The following six are the leading journals used:

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

These journals were chosen on the basis of a survey of the editorial board of the *Journal of Systems and Software* conducted in 1991, and there has been no change in the list of journals since that time in order to

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Table 1: Top scholars in the field of systems and software engineering

Rank	Scholar	Journals in which published						Total score	Prev. rank
		<i>IST</i>	<i>JSS</i>	<i>SPE</i>	<i>SW</i>	<i>TOSEM</i>	<i>TSE</i>		
1	Magne Jørgensen, Simula Research Laboratory	2.4	2	0	1.5	0	4.1	10	3
2	Barbara Kitchenham, Keele U.	2.5	0.6	0	1.7	0	2.1	6.9	4
2	Hai Zhuge, Chinese Academy of Sciences	1	5.9	0	0	0	0	6.9	1
4	Lionel C. Briand, Carleton U.	0.5	1.2	0.5	0	0	4.5	6.7	5
4	Shih-Chien Chou, National Dong Hwa U.	2	4.7	0	0	0	0	6.7	13
6	T.Y. Chen, Swinburne U. of Technology	2.1	2.6	0	0	0.5	0.5	5.7	6
7	Jeff Tian, Southern Methodist U.	0	1	0	1.7	0	2.9	5.6	11
8	Chin-Wan Chung, Adv. Inst. Sci. & Tech.	2	3.4	0	0	0	0	5.4	–
9	Myoung-Ho Kim, Adv. Inst. Sci. & Tech.	1.5	3.2	0	0	0	0	4.7	7
10	Hyoung-Joo Kim, Seoul National U.	1.2	3.3	0	0	0	0	4.5	8
10	James Miller, U. of Alberta	1.5	2.3	0	0	0	0.7	4.5	8
12	Ioannis Stamelos, Aristotle U. of Thessaloniki	1.3	2.6	0	0	0	0.5	4.4	–
13	Jan Bosch, University of Groningen	0	2.5	1.7	0	0	0	4.2	–
14	Khaled El Emam, University of Ottawa	0	1.5	0	0	0	2.6	4.1	2
14	Robert L. Glass, Computing Trends	0.5	2.6	0	1	0	0	4.1	10
14	Mark Harman, Brunel University	1.4	0.8	0.6	0	0	1.3	4.1	–

keep the findings relatively stable. We do not include conference proceedings as a result of an academic decision. This is not due to the limitation of a manual process as suggested by Ren and Taylor (2007).

Here are the findings.

2. Leading scholars

The leading scholars in the field are shown in Table 1. The scores of their frequency of publications in SSE journals in 2001–2005 range from 4.1 to 10. Geographically, 7 scholars are from the Asia-Pacific region, 5 are from Europe, and 4 are from the Americas.

Topping the list in the latest survey is Magne Jørgensen of Simula Research Laboratory, Norway, with a score of 10. (He ranked third in the last survey.) Tied for runner up are Barbara Kitchenham of Keele University, UK (who was fourth last time) and Hai Zhuge of the Chinese Academy of Sciences, China (who was first last time). Both of them score 6.9. Tied for fourth place are Lionel C. Briand of Carleton University, Canada (who was fifth last time) and Shih-Chien Chou of National Dong Hwa University, Taiwan (who was thirteenth last time). Both of them score 6.7.

Sixth is T.Y. Chen of Swinburne University of Technology, Australia, with a score of 5.7. (He had exactly the same rank and score last time.) Seventh is Jeff Tian of Southern Methodist University, USA, with a score of 5.6. (He was eleventh last time.) Eighth is Chin-Wan Chung of Korea Advanced Institute of Science and Technology with a score of 5.4. Ninth is Myoung-Ho Kim of Korea Advanced Institute of Science and Technology with a score of 4.7. (He ranked seventh last time.) Tied for tenth place are Hyoung-Joo Kim of Seoul National University, Korea, and James Miller of University of Alberta, Canada, with a score of 4.5. Both of them were eighth in the last survey.

Table 1 also shows the respective number of publications of the top scholars in the six selected journals.

We have asked the top scholars to indicate the key words that best describe their research focus. The results are shown in Table 2.

3. Leading institutions

The leading 15 institutions in the field are shown in Table 3. The scores of their frequency of publications in

Table 2: Top scholar keywords describing research focus

Rank	Scholar	Research focus
1	Magne Jørgensen	Judgmental processes in software cost estimation
2	Barbara Kitchenham	Evidence-based software engineering, empirical methods, software cost estimation and software metrics
2	Hai Zhuge	Internet-based systems
4	Lionel C. Briand	Software testing, software evolution and empirical software engineering
4	Shih-Chien Chou	Information flow control, web services and software reuse
6	T. Y. Chen	Software testing, debugging and software quality
7	Jeff Tian	Testing and quality improvement, measurement and risk management and web quality engineering
8	Chin-Wan Chung	Database, web, multimedia
9	Myoung-Ho Kim	Database systems and distributed information processing
10	Hyoung-Joo Kim	Databases, XML, semantic web (based on Tse et al. (2006))
10	James Miller	Web engineering, software verification and validation and software requirements engineering
12	Ioannis Stamelos	Empirical software engineering and open source software
13	Jan Bosch	Software architecture design and assessment, software product families, software variability management and strategic software reuse
14	Khaled El Emam	Measurement and quality Improvement
14	Robert L. Glass	Software problems/solutions, software practice, software as discipline and project failure
14	Mark Harman	Slicing, testing and search-based software engineering

SSE journals in 2001–2005 range from 10.70 to 33.63.

Most of the top institutions are from academe. Geographically, 7 of the institutions are from the Asia-Pacific region, 6 are from the Americas, and 2 are from Europe.

Korea Advanced Institute of Science and Technology tops the list in the latest survey, with a score of 33.63. (It was also in first place last time.) The runner up is National Chiao Tung University with a score of 24.09. (It was also second in the last survey.) Simula Research Laboratory, Norway has moved from fourteenth place last time to third this time, scoring 16.45. Seoul National University is fourth with a score of 15.46. (It was also fourth last time.) Carnegie Mellon University with the Software Engineering Institute is fifth with a score of 14.97. (It was third in the last survey).

Georgia Institute of Technology now ranks sixth (from seventh) with a score of 14.57. Iowa State University is seventh (from eleventh) with a score of 13.65. City University of Hong Kong is eighth (from sixth) with a score of 12.99. University of Texas at Dallas is ninth with a score of 12.65. Hong Kong Polytechnic University is tenth with a score of 12.40.

4. Correlation of top institutions and scholars

We have also looked to see whether institutions are highly ranked because they are the home of one or more top scholars. Table 4 shows the result of this analysis.

We can see that only 4 of the top 15 institutions housed a top scholar during the study period and, further, that only Korea Advanced Institute of Science

and Technology housed more than one. Clearly, although top scholars undoubtedly are influential in driving up the scores of SSE institutions, they are not critical to the scores that the institutions achieve.

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Table 3: Top institutions in the field of systems and software engineering

Rank	Institution	Journals	Score	Prev. rank
1	Korea Advanced Institute of Science and Technology, Korea	All but <i>SW</i> and <i>TOSEM</i>	33.63	1
2	National Chiao Tung University, Taiwan	All but <i>IST</i> , <i>SW</i> , and <i>TOSEM</i>	24.09	2
3	Simula Research Laboratory, Norway	All but <i>SPE</i> and <i>TOSEM</i>	16.45	14
4	Seoul National University, Korea	All but <i>SW</i> and <i>TOSEM</i>	15.46	4
5	Carnegie Mellon University/SEI, USA	All	14.97	3
6	Georgia Institute of Technology, USA	All	14.57	7
7	Iowa State University, USA	All but <i>TOSEM</i>	13.65	11
8	City University of Hong Kong, Hong Kong	All	12.99	6
9	University of Texas at Dallas, USA	All but <i>TOSEM</i>	12.65	–
10	Hong Kong Polytechnic University, Hong Kong	All but <i>SW</i> and <i>TOSEM</i>	12.40	–
11	University of Maryland, USA	All but <i>TOSEM</i>	11.69	–
12	Microsoft, USA	All but <i>TOSEM</i>	11.66	8
13	Aristotle University of Thessaloniki, Greece	All but <i>SPE</i> , <i>SW</i> , and <i>TOSEM</i>	11.23	9
14	National University of Singapore, Singapore	All but <i>SPE</i> and <i>TOSEM</i>	11.11	12
15	National Cheng Kung University, Taiwan	All but <i>SPE</i> , <i>SW</i> , and <i>TOSEM</i>	10.70	10

Table 4: Top institutions and top scholars

Rank	Institution	Top scholar
1	Korea Advanced Institute of Science and Technology	Chin-Wan Chung Myoung-Ho Kim
2	National Chiao Tung University	
3	Simula Research Laboratory	Magne Jørgensen
4	Seoul National University	Hyoung-Joo Kim
5	Carnegie Mellon University/SEI	
6	Georgia Institute of Technology	
7	Iowa State University	
8	City University of Hong Kong	
9	University of Texas at Dallas	
10	Hong Kong Polytechnic University	
11	University of Maryland	
12	Microsoft	
13	Aristotle University of Thessaloniki	Ioannis Stamelos
14	National University of Singapore	
15	National Cheng Kung University	

as a Senior Research Scientist and as the project manager in charge of the initiative for Dependable Telecom Software Development. Dr. Wong's research focus is on the development of technology to help practitioners produce high quality software at low cost. In particular, he is doing research in the areas of software testing, maintenance, reliability, metrics, and QoS at the application, as well as architectural design, level. Dr. Wong has published over 100 refereed papers in journals and conference/workshop proceedings. He has served, or is serving, as a special issue guest editor for the *Journal of Systems and Software*, *Software: Practice and Experience*, *Software Quality Journal*, the *International Journal of Software Engineering and Knowledge Engineering*, and the *Journal of Software Testing, Verification & Reliability*, and as a program chair for SSIRI 2008, QSIC 2007, ACM SAC SE Track 2008 & 2007, IWSC 2007 & 2006, Mutation 2006, ISSRE 2005, SEKE 2005, and COMPSAC 2004.

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