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## A Brief History and Overview of WISE

The World Conference on Information Security Education (WISE) has a long history, with the first official event taking place in 1999 in Sweden, hosted by IFIP WG 11.8. However, even before this, information security education had been under discussion at IFIP SEC. Prior to 1995 several IFIP SEC tracks included a focus on education. Then, from 1995 to 1998, four annual workshops focused on the theme “*Information Security Education — Current and Future Needs, Problems and Prospects*”. These events led to the forming of WISE.

In the 14 events to date WISE has been held in 13 countries and on five continents. Table 1 summarises the history of WISE events from 1999 to 2021.

**Table 1.** History of WISE Events (1999–2021)

No.	Year	Dates	Location	Papers	Proceedings
1	1999	17-19 Jun	Stockholm, Sweden	21	Published by the Department of Computer & Systems Sciences, Stockholm University/Royal Institute of Technology (ISBN 91-7153-910-7)
2	2001	12-14 Jul	Perth, Australia	23	Published by the School of Computer & Information Science, Edith Cowan University (ISBN 0-7298-0498-4)
3	2003	26-28 Jun	Monterey, USA	28	<a href="https://doi.org/10.1007/978-0-387-35694-5">https://doi.org/10.1007/978-0-387-35694-5</a>
4	2005	18-20 May	Moscow, Russia	36	Published by the Moscow Engineering Physics Institute (ISBN 5-7262-0565-0)
5	2007	19-21 Jul	West Point, USA	19	<a href="https://doi.org/10.1007/978-0-387-73269-5">https://doi.org/10.1007/978-0-387-73269-5</a>
6	2009	27-31 Jul	Bento Goncalves, Brazil	10	papers combined with WISE 8
7	2011	7-9 Jun	Lucerne, Switzerland	18	papers combined with WISE 8
8	2013	8-10 Jul	Auckland, New Zealand	34	<a href="https://doi.org/10.1007/978-3-642-39377-8">https://doi.org/10.1007/978-3-642-39377-8</a>
9	2015	26-28 May	Hamburg, Germany	13	<a href="https://doi.org/10.1007/978-3-319-18500-2">https://doi.org/10.1007/978-3-319-18500-2</a>
10	2017	29-31 May	Rome, Italy	14	<a href="https://doi.org/10.1007/978-3-319-58553-6">https://doi.org/10.1007/978-3-319-58553-6</a>
11	2018	18-20 Sep	Poznan, Poland	11	<a href="https://doi.org/10.1007/978-3-319-99734-6">https://doi.org/10.1007/978-3-319-99734-6</a>
12	2019	25-27 Jun	Lisbon, Portugal	12	<a href="https://doi.org/10.1007/978-3-030-23451-5">https://doi.org/10.1007/978-3-030-23451-5</a>
13	2020	21-23 Sep	Maribor, Slovenia*	13	<a href="https://doi.org/10.1007/978-3-030-59291-2">https://doi.org/10.1007/978-3-030-59291-2</a>
14	2021	22-24 Jun	Oslo, Norway*	8	In press

\*These events were held virtually

WG 11.8: Information Security Education is a collection of international professionals from academia, military, government and the private sector dedicated to spreading knowledge, understanding, and the practice of computer security and information assurance. WG 11.8 was established in 1991 and aims to “*promote information security education and training at the university level and in government and industry*”<sup>1</sup>. More information can be found on the official working group website at <https://www.ifiptc11.org/wg118>. While topics related to information security education are now predominantly associated with WISE, the event is frequently co-located with IFIP SEC, benefiting from active participation by a broad range of security researchers.

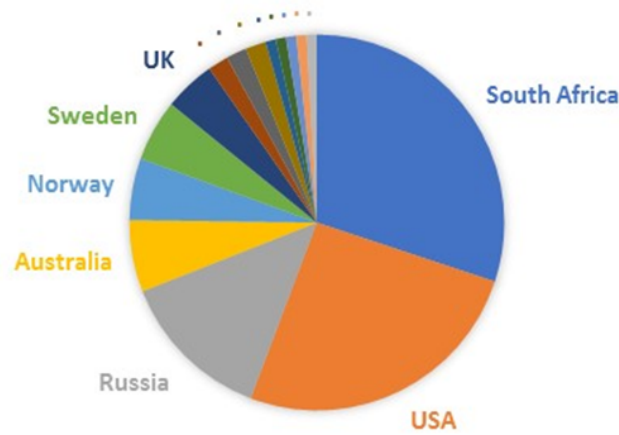
The WISE conferences are proud of presenting and publishing high quality papers. This is ensured through a double-blind review process and publication of accepted papers in an official proceedings. The proceedings for WISE 1, 2 and 4 are inaccessible in practice as they are published as technical reports. However, starting with WISE 5 in 2007, the proceedings have been published by Springer in the series entitled *IFIP Advances in Information and Communication Technology*. These proceedings have an ISBN and are indexed in Scopus. The WISE proceedings published in the Springer series throughout the years present a rich history of the development and growth of the conference.

During the 14 years in which WISE has been held, a total of 231 papers have been presented by authors from the 15 countries shown in the map below (Figure 1), including the USA, UK, South Africa, Russia, Sweden, and Norway. The contribution from each country is shown in Figure 2.



**Fig. 1.** Countries Represented by WISE Authors

<sup>1</sup> <https://www.ifiptc11.org/wg118-mission>



**Fig. 2.** Contributing Countries

A total of 114 papers are currently available in the various proceedings published by Springer. A content analysis based on the title, abstract, and keywords of these papers provide some insight into WISE topic areas. The top terms are shown in the word cloud in Figure 3. The top five terms are: Security, Information, Education, Cybersecurity, and Computer.



**Fig. 3.** Top Terms in Published WISE Papers

Every year the WISE conference solicits submissions under a specific theme and range of topic areas. The theme, and top terms from accepted submissions, for every WISE conference since 2007 are shown in Table 2.

**Table 2.** Conference Themes and Top Terms in WISE Papers (2007–2020)

WISE No.	Year	Theme	Top Terms (excluding ‘information’, ‘security’, and ‘education’)
5	2007	Fifth World Conference on Information Security Education	Computer, training, students, course, forensic, academic
6	2009	Combined with WISE 8	Programming, training, learning, engineering, requirements, students
7	2011	Combined with WISE 8	Computer, students, cyber, technology, curriculum, program
8	2013	Information Assurance and Security Education and Training	Cyber, technology, systems, curriculum, students, infrastructure
9	2015	Information Security Education Across the Curriculum	Cyber, training, design, secure, research, software
10	2017	Information Security Education for a Global Digital Society	Cybersecurity, students, network, awareness, computing, research
11	2018	Information Security Education — Towards a Cybersecure Society	design, cyber, awareness
12	2019	Information Security Education: Research in Proactive Information Security	Research, secure, feedback, training, systems, methods
13	2020	Information Security Education: Information Security in Action	Cybersecurity, students, cyber, problem, technical, development, learning

The top terms listed here exclude ‘information’, ‘security’, and ‘education’ to provide a more nuanced look at WISE topic areas. For example, the term ‘training’ reflects the practical, hands-on nature of many contributions, which examine the transfer of skills or activity processes. It can also be seen that issues relevant to ‘students’ is a common topic area. This often extends beyond the classroom to examinations of security curricula. A further noteworthy term is ‘cybersecurity’ which points to an expanding focus on societal issues beyond information security. Ultimately this reflects the rich and multi-disciplinary topic areas which are relevant to WISE.

As of April 2021 the total number of citations (as reported by Google Scholar), as well as the paper with the highest number of citations, for each proceedings is shown in Table 3.

**Table 3.** WISE Bibliometrics (2007–2020)

WISE No.	Year	Proceedings Citations	Impact Factor	Highest Cited Paper
5	2007	165	8.68	“How to Design Computer Security Experiments” (S. Peisert & M. Bishop)
6	2009	95	9.5	“Two Case Studies in Using Chatbots for Security Training” (S. Kowalski, K. Pavlovska, & M. Goldstein)
7	2011	45	4.5	“An Approach to Visualising Information Security Knowledge” (C. Armstrong)
8	2013	70	5.83	“The Power of Hands-On Exercises in SCADA Cyber Security Education” (E. Sitnikova, E. Foo, & R. Vaughn)
9	2015	59	4.54	“Learn to Spot Phishing URLs with the Android NoPhish App” (G. Canova, M. Volkamer, C. Bergmann, R. Borza, B. Reinheimer, S. Stockhardt, & R. Tenberg)
10	2017	74	5.29	“A Study into the Cybersecurity Awareness Initiatives for School Learners in South Africa and the UK” (E. Kritzinger, M. Bada, & J. Nurse)
11	2018	30	2.73	“A National Certification Programme for Academic Degrees in Cyber Security” (S. Furnell, Michael K, F. Piper, Chris E, Catherine H, & C. Ensor)
12	2019	12	1	“Identifying Information Security Risks in a Social Network Using Self-Organising Maps” (R. Serfontein, H. Kruger, & L. Drevin) & “A Short-Cycle Framework Approach to Integrating Psychometric Feedback and Data Analytics to Rapid Cyber Defense” (E. Moore, S. Fulton, R. Mancuso, T. Amador, & D. Likarish)
13	2020	6	0.46	“An Analysis and Evaluation of Open Source Capture the Flag Platforms as Cybersecurity e-Learning Tools” (S. Karagiannis, E. Maragkos-Belpas, & E. Magkos)

Officer positions within WG 11.8 include chair, vice-chair, and secretary. Individuals are usually appointed to these positions for 3-year terms. Over the years, a total of 14 individuals from seven countries acted as committee members for WG 11.8, as shown in Table 4.

**Table 4.** IFIP WG 11.8 Officers (1991–2021)

Officer	Country	Position	Year
Harold Highland	USA	Chair	1991–1995
Louise Yngström	Sweden	Vice-chair	1993–1995
		Chair	1995–2001
		Vice-chair	2001–2004
Simone Fischer-Hübner	Denmark & Sweden	Secretary	1996–2001
Helen Armstrong	Australia	Vice-chair	1995–2001
		Chair	2001–2005
Daniel Ragsdale	USA	Vice-chair	2000–2005
		Chair	2005–2008
Lynette Drevin	South Africa	Secretary	2001–2005
Ronald Dodge	USA	Secretary	2005–2008
		Secretary	2008–2011
		Chair	2011–2014
		Vice-chair	2005–2008
Natalia Miloslavskaya	Russia	Vice-chair	2008–2011
		Vice-chair	2014–2017
		Vice-chair	2017–2020
Lynn Fitcher	South Africa	Vice-chair	2005–2008
		Vice-chair	2008–2011
		Secretary	2011–2014
		Chair	2014–2017
		Chair	2017–2020
Colin Armstrong	Australia	Chair	2008–2011
Kara Nance	USA	Vice-chair	2011–2014
Matt Bishop	USA	Secretary	2014–2017
		Secretary	2017–2020
		Secretary	2020–
Erik Moore	USA	Vice-chair	2014–2017
		Vice-chair	2017–2020
		Chair	2020–
Jacques Ophoff	UK	Vice-chair	2020–



**Fig. 4.** Several Participants at the WISE 12 Conference (Lisbon, Portugal)  
Back row from the left: Erik Moore, Steven Furnell, Johan van Niekerk, Alexander Tolstoy, Vuyolwethu Mdunyelwa, Audun Jøsang. Front row from the left: Matt Bishop, Natalia Miloslavskaya, Suné von Solms, Lynette Drevin, Lynn Fletcher, Rudi Serfontein.