

An Expert-based Bibliometric for the Science of Security

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Background & Objectives

Our objective was to develop a scalable bibliometric customized for the Science of Security that would address limitations of existing citation-based bibliometrics.^{1,2}

- Existing citation databases do not adequately capture conferences and workshops where security researchers often publish, nor are they adaptive enough to be used with emerging fields of study.
- Computer science databases such as CiteSeerX and dbpl fall short of capturing venues appropriate for disseminating multidisciplinary research.
- Any citation-based metric will be a lagging indicator for fields that evolve at an extraordinarily fast pace.
- Expert-based review is a preferred method for evaluating faculty in computer science, which may be usefully applied to evaluation of publications.^{3,4}

Methods

Publication Venues

Venues where SoS Lablet papers have been published, venues nominated by Lablet researchers, National Security Agency (NSA) program directors, and SoS experts, and security venues included in other computer science publication venue ranking systems (N = 168).

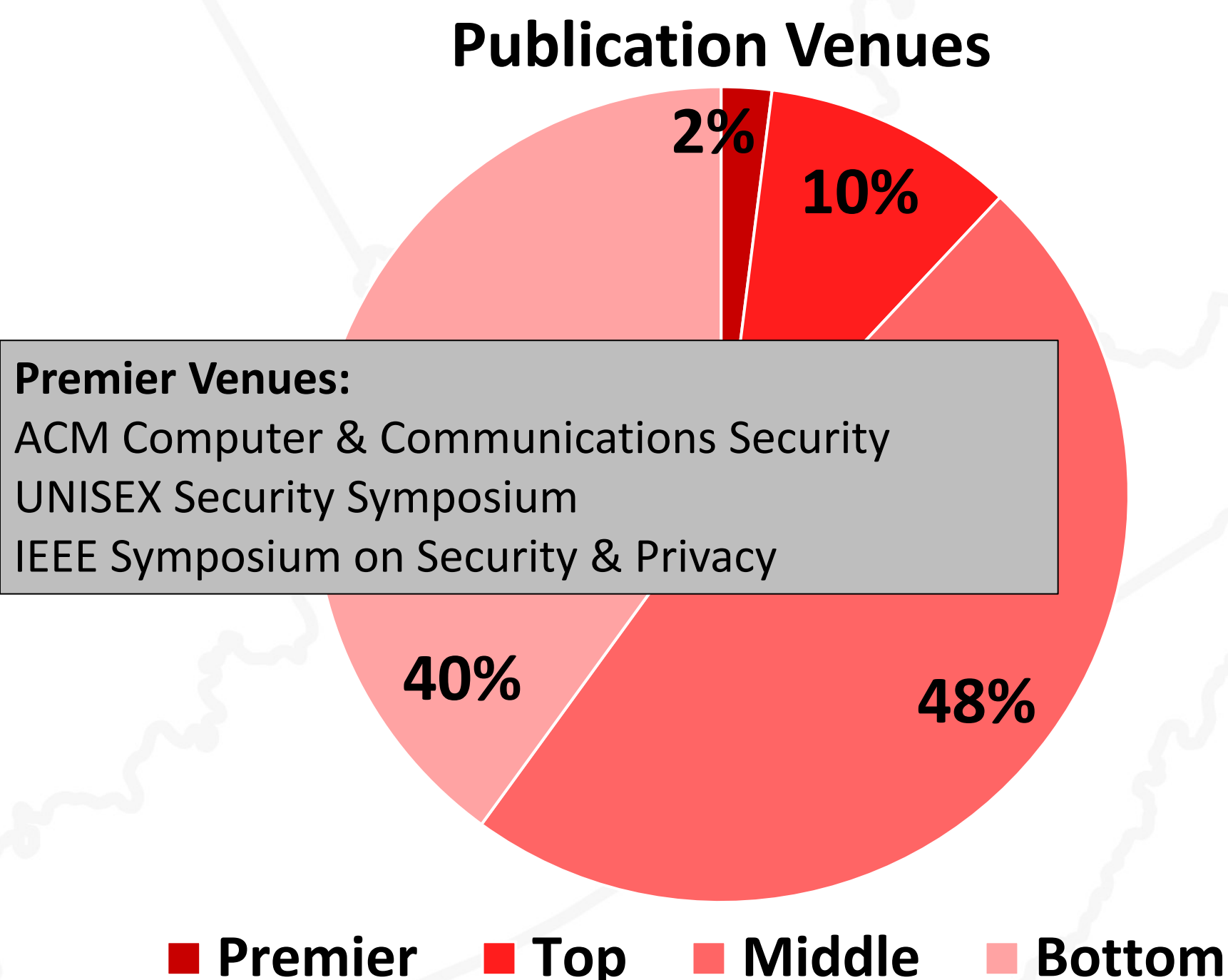
SoS Expert Raters

- Recommended by NSA program directors, SoS Lablet PIs, and other SoS experts, and reviewers for the NSA SoS best paper competition.
- Participating experts (n=21) from university (72%), industry (9%), and government (19%).
- Assigned ratings for the quality of the publication venue and the relevance of the venue to the SoS.
- Rating scale: Premier, top tier, middle tier, and bottom tier venues.

Analysis

We analyzed ratings based on the assumption that the distance between ratings is not consistent. Therefore, we used the mode of all expert ratings to calculate consensus ratings. An overall venue impact rating was then derived based on the lower of the quality and relevance ratings.

Results



Test Case: We used our bibliometric to evaluate the extent to which North Carolina State University SoS Lablet publications are being disseminated through expert rated premier and top tier venues.

Tier	NCSU N	NCSU %
Premier	7	4.3%
Top	6	3.7%
Middle	73	44.8%
Bottom	77	47.2%

Conclusion

Our expert-based method shows potential for developing custom bibliometrics for evaluating publication venues in emerging and multidisciplinary fields. **Next Steps:** Further analysis is needed to determine validity as a bibliometric in science of security.

References

- B. Meyer, C. Choppy, J. Staunstrup, and J. van Leeuwen, Viewpoint: Research evaluation for computer science, *Communications of the ACM*, vol. 52, no. 4, p. 31, 2009
- J. Wainer, C. Billa, and S. Goldenstein, Invisible work in standard bibliometric evaluation of computer science, *Communications of the ACM*, vol. 54, no. 5, p. 141, 2011
- D. Patterson, L Snyder, and J. Ullman, Evaluating computer scientists and engineers for promotion and tenure, *CRA Best Practice Memos*, 1999.
- B. Friedman and F. Schneider, Incentivizing quality and impact: Evaluating scholarship in hiring, tenure, and promotion, *CRA Best Practice Memos*, 2015.

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