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Algorithms for analyzing evolving networks on the Dark Web & in science

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Curriculum Vitae

Hanjo Boekhout was born in Noordwijkerhout, the Netherlands, on the 29th of October 1991. He completed high school at the gymnasium level at “Stedelijk Gymnasium Leiden” in 2010. He subsequently spent a year studying mathematics at the University of Twente, before switching to the Bachelor Computer Science at Leiden University, which he completed cum laude in 2015. Continuing at Leiden University, he completed his Master Computer Science and Advanced Data Analytics cum laude in 2020. Additionally, throughout 2019, he was employed part-time at the Centre for Science and Technology Studies (CWTS) at Leiden University as a research assistant.

Building upon the developed research interests, he was subsequently employed in 2020 by the Leiden Institute of Advanced Computer Science at Leiden University as a PhD candidate in Network Science, to conduct the research presented in this doctoral thesis. He was supervised in this endeavor by Frank Takes and Walter Kosters. During his PhD studies, he took courses in online presenting skills, communication in science, and scientific conduct, among others.

Since late 2025, Hanjo has been employed as a tool-expert at Statistics Netherlands (CBS), the leading independent source for reliable, socially relevant and up-to-date statistical data and information, focused on Dutch society, that is accessible to everyone.

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I thank my promotor Frank Takes for his years of guidance, both prior to and during my doctoral research, as I got to know the field of Network Science and the academic world in general. You have taught me many skills over the years, from academic skills such as writing and reviewing scientific articles and preparing presentations, to teaching skills such as course organization, grading, and student supervision. Your willingness to provide feedback and advise has always been tremendously helpful, even when your changing roles at LIACS made these moments more sparse. I owe all my confidence in both academic and teaching matters to you. Thank you.

I would also like to thank my promoter Walter Kusters. Your feedback and our discussions on minor grammatical details, both during my master and doctoral research, has greatly improved my academic writing skills. Additionally, I thank Arjan Blokland, Eelke Heemskerk, and Niccolò Pisani for their valuable insights and for teaching me more about their respective fields through our collaborative research. I am sure your respective persistence and our freshness, has lead to great success. I am honoured you were open to our collaboration.

I thank my colleagues at LIACS, and especially the CNS group members, for their support, advice, and comradery, that made my time at LIACS comfortable and

enjoyable. I also thank Lynn for their continued friendship and steadfast support throughout these years.

Finally, I would like to thank my family for their support, especially my mom. Our walks during the COVID pandemic made otherwise long and lonely days of research at home bearable. Without you my world would have been much smaller and less bright.

Publication List

Below is a chronological list of publications by the author up to January 2026.

- J. E. van Engelen, H. D. Boekhout, and F. W. Takes. Explainable and efficient link prediction in real-world network data. In *International Symposium on Intelligent Data Analysis*, pages 295–307. Springer, 2016
- H. D. Boekhout, W. A. Kusters, and F. W. Takes. Counting multilayer temporal motifs in complex networks. In *International Conference on Complex Networks and their Applications*, pages 565–577. Springer, 2018
- L. Putman, H. D. Boekhout, and F. W. Takes. Fast incremental computation of harmonic closeness centrality in directed weighted networks. In *Proceedings of the 2019 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining*, pages 1018–1025, 2019
- H. D. Boekhout, W. A. Kusters, and F. W. Takes. Efficiently counting complex multilayer temporal motifs in large-scale networks. *Computational Social Networks*, 6(1):8, 2019
- H. Boekhout, I. van der Weijden, and L. Waltman. Gender differences in scientific careers: A large-scale bibliometric analysis. *arXiv preprint arXiv:2106.12624*, 2021
- H. D. Boekhout, V. A. Traag, and F. W. Takes. Investigating scientific mobility in co-authorship networks using multilayer temporal motifs. *Network Science*, 9(3):354–386, 2021

- H. D. Boekhout, E. M. Heemskerk, and F. W. Takes. Evolution of the world stage of global science from a scientific city network perspective. In *Complex Networks & Their Applications X*, pages 142–154. Springer International Publishing, 2022
- H. D. Boekhout, A. A. Blokland, and F. W. Takes. A large-scale longitudinal structured dataset of the dark web cryptomarket Evolution (2014–2015). *arXiv preprint arXiv:2311.11878*, 2023
- E. S. Olivares, H. D. Boekhout, A. Saxena, and F. W. Takes. A framework for empirically evaluating pretrained link prediction models. In *International Conference on Complex Networks and Their Applications*, pages 150–161. Springer, 2023
- H. D. Boekhout, A. A. Blokland, and F. W. Takes. Early warning signals for predicting cryptomarket vendor success using dark net forum networks. *Scientific Reports*, 14(1):16336, 2024
- N. Pisani, H. D. Boekhout, E. M. Heemskerk, and F. W. Takes. China’s rise as global scientific powerhouse: A trajectory of international collaboration and specialization in high-impact research. *Research Policy*, 54(8):105288, 2025
- H. D. Boekhout and F. W. Takes. Fast maximal clique enumeration in weighted temporal networks. *Social Network Analysis and Mining*, 16(1):10, 2026
- H. D. Boekhout, E. M. Heemskerk, N. Pisani, and F. W. Takes. Freshness, persistence and success of scientific teams. *arXiv preprint arXiv:2507.12255*, 2025