Curriculum Vitae — Prof. Dr. Bernd Meyer

Personal Details

Full Name:	Dr. Bernd Meyer
Date of Birth:	April 16, 1965
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Academic Qualifications

- June 1994: Dr. rer. nat, Informatik, University of Hagen, Germany.
  Summa cum Laude. Equivalent PhD Computer Science. Thesis Title: *Visual Logic Languages for Spatial Information Handling* (in German). Supervisor: Prof. Dr. Ralf Hartmut Güting.

- June 1990: Diplom Informatik, Technical University of Braunschweig, Germany.
  ***"Mit Auszeichnung"* (= Summa cum Laude)**. Thesis Title: *Foundations of Prototyping Entity-Relationship Based Information Systems Using Prolog* (in German).

Appointments

- since January 2022: Professor and Associate Dean (Sustainability), Faculty of Information Technology, Monash University.
- since January 2023: Associate Direcctor (Environment & Sustainability), Monash Data Futures Institute.
- July 2018 - December 2021: Professor and Associate Dean (Graduate Research), Faculty of Information Technology, Monash University.
- July 2017 - June 2018: Professor and Deputy Dean (Education), Faculty of Information Technology, Monash University.
- February 2014 - June 2017: Professor and Director Education Outreach, Faculty of Information Technology, Monash University.
- January 2011 - December 2013: Associate Dean of Education, Faculty of Information Technology, Monash University.
- January 2007 - February 2014: Associate Professor, Faculty of Information Technology, Monash University, tenured.
- January 2001–December 2006: Senior Lecturer, School of Computer Science and Software Engineering, Monash University, tenured.
- January 2000–December 2000: Lecturer, School of Computer Science and Software Engineering, Monash University.
- August 1999–December 1999: Research fellow, Monash University, Melbourne, Faculty of Information Technology.
- July 1997–May 1999: Research fellow and lecturer, University of Munich, Germany.
- July 1995–July 1997: In July 1995 I received a highly competitive postdoctoral research award (No. ME11/94) from the German Research Council (Deutsche Forschungsgemeinschaft, DFG) enabling me to work abroad for two years as an independent research fellow.

  - July 1995–September 1996: Visiting scientist, Monash University, Melbourne.
  - September 1996–July 1997: Visiting scientist, University of Colorado in Boulder.
- July 1994–July 1995: Lecturer, Computer Science Department, University of Hagen, Germany. Hagen is the leading distance teaching university in Germany.
- 1994: Adjunct Lecturer, University of Dortmund, Germany.
- March 1990–July 1994: Research fellow, Computer Science Department, University of Hagen, Germany.

Grants

I am and have been chief-investigator of successful ARC Discovery proposals with a total volume of more than A$3.5 million

- 2024-2028: Australian node in NSF Global Centre "Artificial Intelligence and Biodiversity Change" (active, with T. Berger-Wolf, M. Jarzyna, J. Kitzes, S.M. Beery, T. Burghardt, O. Mac Aodha, S. O'Donnell and D. Tuia)
- 2021-2024: ARC Discovery Grant "Self-organised communication as a foundation of large, complex societies" as principal chief investigator with a volume of A$596,886 (active, with C. Reid, T. Landgraf and I. Couzin).
- 2018-2020: ARC Discovery Grant "Modelling collective behaviour to protect social insect ecosystem services" as principal chief investigator with a volume of A$325,000 (completed, with M. Burd, J. Garcia, A. Traulsen and H.J. Offenberg).
- 2018-2020: WISE Grant "Driving social change: Women, Entrepreneurship, and IoT" with a volume of A$230,000 (completed, with C. Gonsalvez, J. Whittle, et al.)
- 2016-2019: ARC Discovery Grant "Real-time modelling of crowd dynamics for disaster prevention" as chief investigator with a volume of A$440,000 (completed, with M. Sarvi and M. Burd).
- 2016-2017: DAAD-UA Joint Research Grant "Division of Labour and Collective Homeostasis in Dynamic Environments" with a volume of A$50,000 (completed, with Chr. Kleineidam)
- 2014: Google 'Computer Science for High Schools' - Victorian Node Initiative, with a volume of A$15,000 (completed).
- 2011-2013: ARC Discovery Grant for "Modelling and simulation of self-organised behaviour in biological and bio-inspired systems" as principal chief investigator, with a volume of A$255,000 (completed).
- 2013: Google 'Computer Science for High Schools' - Victorian Node Initiative, with a volume of A$15,000 (completed).
- 2012: 2 x EPSRC Global Collaboration Grants in Computational Biology with a combined volume of A$42,000 (completed).
- 2012: Google 'Computer Science for High Schools' - Victorian Node Initiative, with a volume of A$15,000 (completed).
- 2008-2011: ARC Discovery Grant for "Adaptiveness of Self-organized Decision-Making" as principal chief investigator, with a volume of A$ 370,000 (completed).
- 2004-2008: ARC Discovery Grant for "Supporting Adaptive Diagrammatic Communication" as chief investigator, with a volume of A$ 1,450,000 (completed).
- 2001–2003: ARC Large Grant for "A Computational Framework for Reasoning with Diagrams" as principal chief investigator. Volume: A$ 181,000 (completed).
- 2002: Monash FITR Grant for "Adaptive Systems" as co-investigator. Volume: A$ 80,000 (completed).

- 2001: Monash Small Grant for "Linear Constraint Logic Programming for Diagrammatic Reasoning" as chief investigator. Volume: A$ 14,300 (completed).
- June 2000–July 2000: GETGRATS ("General Theory of Graph Transformation Systems" TMR Network funded by the European Commission): Individual travel grant to work on visual language interpretation frameworks at the University of Rome (completed).
- July 1995–July 1997: Individual postdoctoral research award from the German Research Council (Deutsche Forschungsgemeinschaft, DFG) for research on "constraint-logic based methods for the specification of visual languages and their usage in compiler construction." Volume: DM 110,000 (completed).

Editorial Responsibilities and Conference Chairs

- since 2015: Editorial board member of "Natural Computing", Springer-Verlag.
- 2006-2016: Editorial board member of "Swarm Intelligence", Springer-Verlag.
- since 2006: Editorial board member for CSLI Publications (Stanford University): Studies in the Theory and Applications of Diagrams.
- 2002: Co-chair of the "Diagrams 2002" conference.
- 2002: Co-editor of "Diagrammatic Representation and Inference", Springer Verlag.
- 2001: Co-editor of "Diagrammatic Representations and Reasoning", Springer Verlag: the first monograph summarizing the state of the art in diagrammatic reasoning.
- 2000 – 2009: Steering Committee member of the "Diagrams" conference series.
- 2000: Publicity chair of the "Diagrams 2000" conference.
- 1999: Special track co-chair of the IEEE Symposium on Visual Languages.
- 1998: Co-editor of the first monograph on theoretical foundations of visual languages: "Visual Language Theory", Springer Verlag.
- 1998: Co-chair of the AAAI Fall Symposium on Formalizing Reasoning with Visual and Diagrammatic Representations.
- 1997: Special issue co-editor of the Journal of Visual Languages and Computing.
- 1997: Co-chair of the International IEEE Workshop on Theory of Visual Languages.
- 1996: Co-chair of the ACM AVI Workshop on Theory of Visual Languages.

Publications

I have authored over 90 peer-reviewed publications and have received 3 Best Paper Awards and one Best Paper Award Special Mention at leading international conferences. My h-index is 27. A full list of my publications can be found on my my Google Scholar profile profile or in chronological order on my own web pages at `http://berndmeyer.net/research/references/`

Current and Recent Major Projects

My work is in data-intensive computational ecology. I develop mathematical and computational models for the interactions of organisms with their environment, including the impact our changing environment has on their lives. My lab is also working on Artificial Intelligence for animal monitoring as the basis for ecosystem monitoring and for automating experiments.

Most of my research focuses on the collective behaviour of social insects, such as ants and bees, in the hope that a deeper understanding of their behaviour will allow us to better protect them and the important ecosystem services they provide. How these self-organised "super-organisms" coordinate their actions is still a largely open question. My research utilizes and extends a range of mathematical and computational techniques, including evolutionary game theory, reinforcement learning, reaction-advection diffusion, and stochastic event analysis to explain this. Some of it has interesting implications for a branch of bio-mimetic algorithm design, popularly known as "swarm intelligence."

- *Bioacoustic sensing*, collaboration with Rohan Clarke (Monash), Daniela Teixeira (QUT), Andre Chiaradia (Phillip Island Nature Parks), Tanya Berger-Wolf (Ohio State University)
- *Communication networks in social insect colonies*, collaboration with Chris Reid (Macquarie), Tim Landgraf (FU Berlin) and Iain Couzin (MPI of Animal Behavior and University of Konstanz)
- *AI, machine learning and predicting species responses to global change*, collaboration with Reid Tingley (Monash), Melodie McGeoch (Monash), Alan Dorin (Monash) and Carla Sgro (Monash)
- *Acoustic ecosystem monitoring*, collaboration with Christoph Bergmeir (Monash), Reid Tingley (Monash) and Lin Schwartzkopf (James Cook University)
- *Models of division of labour in social insects*, collaboration with Julian Garcia (Monash), Anja Weidenmüller (Universität Konstanz) and Christoph J Kleineidam (Universität Konstanz)
- *Colony resilience and social insect ecosystem services*, collaboration with Martin Burd (Monash), Julian Garcia (Monash), Arne Traulsen (MPI Plön) and Hans Joachim Offenberg (University Aarhus)
- *Infrastructure investment in leafcutter ant colonies*, collaboration with Martin Burd (Monash) and Christoph J. Kleineidam (University of Konstanz)
- *Modelling and simulation of self-organised behaviour in biological and bio-inspired systems*, collaboration with Barry Hughes (University of Melbourne) and Toshiyuki Nakagaki (RIES, University of Hokkaido, Sapporo).
- *Adaptiveness of self-organized collective decision making*, collaboration with Audrey Dussutour (Centre for Animal Cognition, Universite Paul Sabatier, Toulouse).
- *Affordable tera-scale reaction-diffusion simulation*, collaboration with Matthias Vigelius (Monash).