

Curriculum Vitae: Wolfgang Konen

CONTACT INFORMATION

Professor, Computer Science Institute,
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CAREER SUMMARY

I am currently Professor of Computer Science and Mathematics at TH Köln – University of Applied Sciences, Cologne, Germany, and head of the Cologne Institute of Computer Science. I am founding member of the Research Center Computational Intelligence, Optimization & Data Mining (<https://blogs.gm.fh-koeln.de/ciop/>) and the Research Center Ciplus (<http://ciplus-research.de>). I received my Diploma in physics in 1987 and my Ph.D. degree in theoretical physics in 1990 from the University of Mainz, Germany. I worked in the area of neuroinformatics and computer vision as researcher and group leader at Ruhr-University Bochum, Germany, from 1990-1994, and in several companies as head of data mining and computer vision business units from 1994–2004.

I have secured external research grants worth over 750K EUR and partial funding for 4 PhD scholarships in the last twelve years. I have authored over 153 refereed publications (34 in journals). Currently (April 2022), my h-index is 22 with 4326 citations. I have successfully supervised 50 Bachelor or Master theses and three PhD theses (in cooperation with T. Bäck, Leiden University, NL). Currently I am supervising 1 further PhD thesis.

RESEARCH INTERESTS

My research interests include, but are not limited to: artificial intelligence, optimization, understanding how humans and computer learn, reinforcement learning, the dynamics of learning systems, machine learning & data mining, surrogate models (RBF and Kriging), time series prediction, anomaly detection, computational intelligence in games, and computer vision.

WORK EXPERIENCE

TH Köln – University of Applied Sciences, Professor (full time)

(2004 – to date)

NuTech Solutions GmbH, Dortmund – Senior Consultant (part time)	(2004 – 2008)
HS Düsseldorf – University of Applied Sciences, Professor (part time)	(2003 – 2004)
Thinking Networks SI GmbH, Bochum – Head of Data Mining Business Unit Leader (5 persons, revenue per year approx. 0.7M EUR)	(2000 – 2004)
ZN GmbH, Bochum – Head of Computer Vision Business Unit Leader (10 persons, revenue per year approx. 2.0M EUR)	(1994 – 2000)
Ruhr-University Bochum – Research Scientist, PostDoc	(1990 – 1994)

EDUCATION

Ph.D. in Theoretical Physics from Johannes Gutenberg University Mainz	(1990)
Diploma in Experimental Physics from Johannes Gutenberg University Mainz	(1987)

RESEARCH GRANTS

SOMA <i>Systematic Optimization of Models for Automation</i> , funded by BMBF, 257K EUR	(2009-2013)
MONREP <i>Model-based Optimization for Nonlinear and Restricted Production Processes</i> , funded by BMWi, 175K EUR	(2014-2016)
GroupLearn <i>Fellowship for Innovations in Digital University Teaching</i> , funded by MKW NRW, 50K EUR	(2020-2021)
(RL)³ <i>Representation-, Reinforcement- and Rule-Learning</i> , as part of the <i>Graduate College Data-NInJA</i> („Next Generation Intelligence Joins Robust Data Analysis“), funded by MKW NRW, 250K EUR	(2021-2024)

MEMBERSHIPS

- GfKI** German Classification Society
- VDI-GMA** Fachausschuss 5.14 „Computational Intelligence“
- ACM SIGEVO** Special Interest Group on Genetic and Evolutionary Computation
- CIOP** Research Center Computational Intelligence, Optimization & Data Mining, TH Köln
- Ciplus** Research Center Computational Intelligence plus, TH Köln

PROFESSIONAL SERVICES

Reviewer for several international journals in computer sciences like *Applied Soft Computing (ASOC)*, *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, *IEEE Transactions on Computational Intelligence and AI in Games (TCIAIG)*

Reviewer for several institutions, e. g. The Netherlands Organisation for Scientific Research (NWO), Studienstiftung des Deutschen Volkes, Hermann von Helmholtz Association of German Research Centres, DAAD, DFG.

Member of Program Committees for a number of international conferences in the field, e. g. Genetic and Evolutionary Computing Conference (GECCO, 2009, 2015, 2016, 2017, 2018, 2019), Parallel Problem Solving from Nature (PPSN, 2008, 2010, 2020, 2022), European Conference on Data Analysis (ECDA, 2013, 2018), Bioinspired Optimisation Methods and Their Applications (BIOMA, 2018, 2020).

PROFESSIONAL KNOWLEDGE AND SKILLS

- Scientific expertise and practical applications of artificial intelligence, neural networks, data mining, machine learning, optimization, time series, forecasting technologies and image processing
- Advanced analytical and project consulting expertise
- Advanced management skills & leadership skills
- Programming languages: Java, R, Python, C, C++, Matlab

PUBLICATIONS

I have authored over 153 refereed publications (34 in journals).

Currently (April 2022), my h-index is 22 with 4326 citations.

A full list of my publications is available from <https://blogs.gm.fh-koeln.de/konen/en/>.

Selected publications (the ten most important publications in my career, in chronological order):

REFERENCES

- [1] Martin Lades, Jan C. Vorbrüggen, Joachim Buhmann, Jörg Lange, Christoph von der Malsburg, Rolf P. Würtz, and Wolfgang Konen. Distortion invariant object recognition in the dynamic link architecture. *IEEE Transactions on Computers*, 42:300–311, 1993.
- [2] Wolfgang Konen. Comparing facial line-drawings with gray-level images: A case study on phantomas. In Christoph von der Malsburg and Werner von Seelen, editors, *International Conference on Artificial Neural Networks (ICANN)*, Bochum, 1996. North-Holland.
- [3] Wolfgang Konen, Martin Scholz, and Stephan Tombrock. Robust registration procedures for endoscopic imaging. *Medical Image Analysis*, 11(6):526–539, December 2007.

- [4] Patrick Koch, Wolfgang Konen, and Kristine Hein. Gesture recognition on few training data using slow feature analysis and parametric bootstrap. In *2010 International Joint Conference on Neural Networks*, 2010.
- [5] Wolfgang Konen, Patrick Koch, Oliver Flasch, Thomas Bartz-Beielstein, Martina Friese, and Boris Naujoks. Tuned data mining: A benchmark study on different tuners. In Natalio Krasnogor, editor, *GECCO '11: Proceedings of the 13th Annual Conference on Genetic and Evolutionary Computation*, pages 1995–2002, 2011.
- [6] Patrick Koch, Bernd Bischl, Oliver Flasch, Thomas Bartz-Beielstein, Claus Weihs, and Wolfgang Konen. Tuning and evolution of support vector kernels. *Evolutionary Intelligence*, 5:153–170, 2012.
- [7] Samineh Bagheri, Markus Thill, Patrick Koch, and Wolfgang Konen. Online adaptable learning rates for the game Connect-4. *IEEE Transactions on Computational Intelligence and AI in Games*, 8(1):33–42, 2016. accepted 11/2014.
- [8] Samineh Bagheri, Wolfgang Konen, and Thomas Bäck. Online selection of surrogate models for constrained black-box optimization. In Yaochu Jin, editor, *SSCI'2016, Athens*, pages 1–8. IEEE, December 2016. Best Student Paper Award.
- [9] Samineh Bagheri, Wolfgang Konen, Richard Allmendinger, Jürgen Branke, Kalyanmoy Deb, Jonathan Fieldsend, Domenico Quagliarella, and Karthik Sindhya. Constraint handling in efficient global optimization. In Peter A. N. Bosman, editor, *Genetic and Evolutionary Computation Conference 2017 (GECCO'17), Berlin*, pages 673–680. ACM, July 2017.
- [10] Samineh Bagheri, Wolfgang Konen, Michael Emmerich, and Thomas Bäck. Self-adjusting parameter control for surrogate-assisted constrained optimization under limited budgets. *Applied Soft Computing*, 61:377–393, 2017.