

Andreas Holzinger, 3-Pages Scientific Résumé as of December 2018

“Science is to test crazy ideas - Engineering is to put these ideas into Business”

PERSONAL DATA:

Current Positions Lead Holzinger Group, Research Unit HCI-KDD, 2010–
Assoc.Prof. for Applied Computer Science, TU Graz, 2003–
Visit.Prof. Machine Learning for Health Informatics, TU Wien, 2016–

Primary Address Institute for Medical Informatics, Statistics and Documentation,
Medical University Graz, Auenbruggerplatz 2/V, 8036 Graz, Austria

Second Address Institute of Interactive Systems and Data Science,
Graz Univ. of Technology, Inffeldgasse 16c, A-8010 Graz, Austria

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Group Homepage www.hci-kdd.org *Personal Homepage:* www.aholzinger.at

Date of Birth 18.04.1963, *Nationality:* Austrian



TOPICS: Explainable-AI, Machine Learning, Knowledge Extraction **APPLICATION AREA:** Health Informatics

ORCID: <http://orcid.org/0000-0002-6786-5194> **DBLP:** <https://dblp.uni-trier.de/pers/hd/h/Holzinger:Andreas.html>

100-words RESEARCH STATEMENT:

Andreas promotes a synergistic approach towards *understanding intelligence*, enabling context-adaptive systems, by integrating two areas: Human-Computer Interaction (HCI) & Knowledge Discovery/Data Mining (KDD) with the goal to augment human intelligence with AI. Andreas has pioneered in interactive machine learning (iML) with the human-in-the-loop with application in health. His contribution is relevant due to raising legal and privacy issues in order to make decisions transparent, understandable and re-traceable, hence to explain *why* a decision has been made.

150-words BIOGRAPHY:

Andreas obtained a PhD in Cognitive Science from Graz University in 1998 and his Habilitation (second PhD) in Computer Science from TU Graz in 2003. He is Associate Editor of Springer-Nature Knowledge and Information Systems, Section Editor for Machine Learning of Springer-Nature BMC Medical Informatics & Decision Making, and Editor-in-Chief of Machine Learning & Knowledge Extraction; organizer of the IFIP Cross-Domain Conference Machine Learning & Knowledge Extraction, Austrian representative in TC 12 Artificial Intelligence, and member of IFIP WG 12.9 Computational Intelligence, the ACM, IEEE, GI, AAAI and the Austrian Computer Society. He serves as consultant for the Canadian, US, UK, Swiss, French, Italian and Dutch governments, for the German Excellence Initiative, and as national expert in the European Commission. Since 2003 he has participated in leading positions in 30+ R&D multi-national projects, budget 6+ MEUR, 300+ publications, 10k+ citations, Scholar h-index = 47, SCOPUS h-index = 33.

PREVIOUS POSITIONS:

2017 spring Visiting Professor for Machine Learning in Health Informatics, Univ. Verona, IT

2015–2016 Area manager for Data & Machine Learning, FFG K1 Center of Excellence Biomarker Discovery, Graz, AT

2012 spring Visiting Professor for HCI-KDD for e-health, UCLIC, University College London, UK

2011–2012 Visiting Professor for iKDD in e-health, RWTH Aachen University, DE

2007 spring Visiting Professor for HCI-KDD, Middlesex University London, UK

2005–2006 Visiting Professor for Human-Computer Interaction, Vienna TU Vienna, AT

2004–2005 Visiting Professor for Medical Knowledge Management, Innsbruck University, AT

2003–2004 Technical Director and Lead of Software Development of the Virtual Medical Campus Graz, AT

2002–2003 Visiting Professor for Medical Decision Support at the Fresenius Nations Health School, Berlin, DE

EDUCATION:

1998–2003 Habilitation (second PhD) in Applied Computer Science, Graz University of Technology

1995–1998 PhD – Doctor of Philosophy, Cognitive Science, University of Graz with summa cum laude

1994–1996 MPh – Master of Philosophy in Media and Sociology, University of Graz, with distinction

1993–1995 MSc – Master of Science in Physics Education, University of Graz, with distinction

1990–1993 BEng – Bachelor of Electrical and Communications Engineering, Graz University of Technology

1991–1992 Dipl.Ed. - Diploma for Adult Education in Computer Programming, Chamber of Commerce Styria

1987–1990 CEng - Chartered Engineer in Communication & Information Engineering, Chamber of Commerce Styria

1986–1987 Kings College of Further Education, Bournemouth (UK), with honors in Computing

AWARDS AND HONORS (selected):

- 2018* IFIP World Computer Conference: Mentioned as among the top 10 cited experts in AI in Austria
- 2018* Elsevier, US: Excellent Reviewer Award Journal of Artificial Intelligence for Medicine
- 2018* Elected as Austrian Representative to the IFIP Technical Committee TC 12 Artificial Intelligence
- 2013* Best Paper Award, SouthCHI, Maribor, SI
- 2012* Best Paper Award at ICE-Business conference, Rome, IT
- 2011* Best Paper Award ICE-Business conference, Sevilla, ES
- 2010* Industrial Software Grant, Styrian Business Promotion Agency, AT
- 2010* Best Paper Award DATA conference, Athens, GR
- 2010* Science Ideas Competition Award, Science Park Graz, AT

INVITED PRESENTATIONS TO INTERNATIONAL CONFERENCES AND SCHOOLS (10 selected):

- 2018* Keynote at IEEE World Symposium on Digital Intelligence for Systems & Machines, Kosice, SK
- 2017* Keynote at DATA 2017, Universidad Rey Juan Carlos (URJC), ES
- 2016* Keynote at 20th Knowledge Engineering Systems Conference, York, UK
- 2015* Tutorial on interactive machine learning at Princess Margaret Cancer Center, University of Toronto, CA
- 2014* Extravaganza Tutorial on interactive Knowledge Discovery, World Intelligence Conference, Warsaw, PL
- 2014* Keynote on interactive Knowledge Discovery, VISIGRAPP 2014, Lisbon, PT
- 2013* Keynote on Big Health Data at IBM Industrial Big Data summit, Vienna, AT
- 2012* Invited Keynote on interactive Knowledge Discovery at DATA 2012, Rome, IT
- 2011* Invited Research Seminar for Chi+Med (EPSRC EP/G059063/1) UCL London, UK
- 2010* Invited Research Seminar on Knowledge Discovery from medical data, RWTH Aachen

GRANTS (selected):

- 2019—2024* EU H2020: SC1-FA-DTS RIA 826078 Feature Cloud (Co-PI, lead ex-AI), 4,6 MEUR, PI on 600 kEUR;
- 2016—2019* EU H2020: Marie Curie ACROSSING Smarter Assisted Living solutions, Co-PI on 511 kEUR;
- 2014—2017* FFG: K1 CBmed, MALBIODI, iML for Biomarker Discovery, PI on 540 kEUR;
- 2011—2012* EU FP 7: ICT-2011.95 FET-Flagship IT Future of Medicine, Co-PI on 237 kEUR;
- 2010—2014* EU FP 7: IST-2010-248590 REACTION, Co-PI; PI on 204 kEUR;
- 2013—2016* Industry: IBM Watson Think Group, Technical Lead; PI on 270 kEUR;
- 2010—2012* FFG: iVisPRO Intelligent Complexity Reduction, PI on 22 kEUR;
- 2010—2012* SFG: EMOMES: Emotion detection and decision support, Technical lead, PI on 58 kEUR;
- 2007—2010* EU FP 6: IST-2005-2.6.2 045056 EMERGE, Emergency Monitoring/Prevention, PI on 300 kEUR;
- 2004—2005* FFG: HAEMOSIM, Haemodynamics Simulation Project, PI
- 2002—2004* Austrian Ministry of Science: Virtual Medical Campus Graz, PI on 450 kEUR;

EXPERT EVALUATION SERVICES (selected):

- 2013–present* Evaluator for the European Research Council, Frontier Research Grants, EU
- 2013–present* Evaluator for Schweizer Nationalfonds zur Förderung der wissenschaftlichen Forschung, CH
- 2013–present* Evaluator for Agence Nationale de la Recherche (ANR), FR
- 2013–present* Evaluator for the National Science Foundation (NSF), US
- 2012–present* Evaluator for the Italian Research Agency, Consiglio Nazionale delle Ricerche, Roma, IT
- 2011–present* Evaluator for the National Research Council Canada (NRC), CA
- 2010–present* Evaluator for Deutsches Bundesministerium für Bildung und Forschung, Exzellenzinitiative, DE
- 2006–present* Evaluator for Netherlands Organization for Scientific Research (NWO), NL
- 2003—2008* Project Evaluation Officer (3 times) for the European Commission, Brussels, BE
- 2003–present* Regular reviewer for a number of scientific journals, including: Springer/Nature Machine Learning (MACH), ACM Computing Surveys, IEEE Transactions on Human-Machine Systems (THMS), Elsevier Artificial Intelligence in Medicine (AIME), Oxford Journal of the American Medical Informatics Association (JAMIA), Springer Nature Neural Computing and Applications (NCAA), Elsevier International Journal of Medical Informatics (IJMI), etc.

EDITORIAL POSITIONS (selected - last 5 years):

- 2015–present* Springer/Nature BMC Medical Informatics and Decision Making, Section Editor for Machine Learning
- 2016–present* Springer/Nature Machine Learning (MACH) Guest Editor Journal Track ECML-PKDD 2017
- 2016–present* Elsevier International Journal of Human-Computer Studies, Editorial Board Member
- 2017–present* MDPI Machine Learning & Knowledge Extraction, Editor-in-Chief
- 2014–present* Springer/Nature KAIS Knowledge and Information Systems, Associate Editor
- 2014–present* Springer/Nature BRIN Brain Informatics, Editorial Board Member
- 2013–2014* Springer/Nature BMC Bioinformatics, Guest Editor
- 2013–2014* Elsevier Journal of Information Processing and Management, Guest Editor

SERVICES TO THE INTERNATIONAL RESEARCH COMMUNITY (selected):

- since 2017* Organizer of the IFIP Cross Domain Conference for Machine Learning & Knowledge Extraction (CD-MAKE)
- 2016* Program co-chair of the IFIP CD-ARES conference and of the DEXA ITBAM conference
- 2015* Co-chair at the 14th IEEE Intl. Conference on Machine Learning and Applications, Miami (FL), US
- 2014* General chair at the DATA conference in Vienna, Austria
- since 2011* Organizer of yearly workshops HCI-KDD: Graz 2010 (AT), Macau 2011 (CN), Maribor 2012 (SI), Regensburg 2013 (DE), Lisbon 2013 (PT), Warsaw 2014 (PL), Banff 2015 (CA), London 2015 (UK), Salzburg 2016 (AT), Reggio 2017 (IT), Hamburg 2018 (DE), Canterbury 2019 (UK), Dublin 2020 (IE), Vienna 2021 (AT)

UNIVERSITY TEACHING (selected):

- 2016–present* LV 185.A83, 3 ECTS, 2h, G, 50, Machine Learning for Health Informatics (Python), TU Vienna [Link](#)
- 2011–present* LV 706.315, 2 ECTS, 2h, PG, 10, Selected Topics iKDD: Methods of explainable AI, TU Graz [Link](#)
- 2010–present* LV 706.046, 5 ECTS, 5h, G, 30, AK HCI: Intelligent UI: Towards explainable AI, TU Graz [Link](#)
- 2010–present* MiniCourse, 3 ECTS, 1h, PG, 40, Medical Knowledge and Probabilistic Decision Making, WU Vienna [Link](#)
- 2017 summer* LV 340.300, 3 ECTS, 2h, G, 50, Interacting with Agents (federated machine learning), Univ. Linz
- 2017 spring* LV 004.553, 6 ECTS, 3h, G, 30, Machine Learning & Knowledge Extraction for Health, Univ. Verona
- 2013–2017* LV 709.049, 3 ECTS, 2h, UG, 150, Biomedical Informatics, TU Graz
- 2010–2013* LV 444.152, 3 ECTS, 2h, UG, 100, Medical Informatics, TU Graz
- 2011–2012* Seminar, 6 ECTS, 3h, PG, 10, Selected Topics on iKDD for eHealth, RWTH Aachen
- 2003–2011* LV 400.141, 3 ECTS, 3h, UG, 220, Information, Knowledge & Decision Support, Medical University Graz
- 2009–present* Member of the Doctoral School "Computer Science" at Graz University of Technology

SUPERVISION OF STUDENTS AND POSTDOCTORAL FELLOWS:

Since 2003 I supervised 38 BSc students, 27 MSc students, 16 PhD students, 6 Postdocs; many of my previous students have now leading positions (e.g. Fraunhofer, Max Planck, Austrian Institute of Technology, Software Competence Center Hagenberg, Secure Business Austria, RWTH Aachen, Universite Paris Sud, UCL London, City University London, etc.), and large companies (e.g. Google, Amazon, Philips, Siemens, General Electric, VAMED, ...) or founded their own successful companies and start-ups (e.g. eLibera, Ranorex, Nimblo, Byt poets, ...).

OPEN SOURCE SOFTWARE OF THE HOLZINGER GROUP (recent, selected):

- Augmentor:** An Image Augmentation Library for Machine Learning
Python Version: <https://github.com/mbloice/Augmentor> <http://augmentor.readthedocs.io>
Julia Version: <https://github.com/Evizero/Augmentor.jl> <http://augmentorjl.readthedocs.io>
- Graphinius:** Graph-Based Machine Learning– GraphiniusJS (Base Library)
<https://github.com/cassinius/GraphiniusJS>
– GraphiniusVIS (Visualization Module) <https://github.com/Niciii/GraphiniusVis>
– GraphiniusPlatform <http://graphinius.io>
- TUGrovis:** Tumor growth visualization towards in-silico tumor-growth simulation
<https://github.com/davcem/cpm-cytoscape>