

Curriculum Vitae

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EDUCATION

- 1989 Habilitation in Computer Science, University of Osnabrück, Germany
Thesis: *Zur intelligenten Organisation von Wissensbeständen in künstlichen Systemen*
Mentor: Prof. B. Mahr
- 1980 Ph.D. (Dr. rer. nat.) in Computer Science, University of Hannover, Germany
Dissertation: *Simultane zellulare Kalküle und lokal-synchrone Zellularautomaten*
Advisor: Prof. G. Bertram, Co-advisor: Prof. K. Döpp
- 1975 M.S. in Mathematics (Dipl.-Math.), University of Hannover, Germany
- 1971 B.S. in Mathematics, University of Hannover, Germany

PROFESSIONAL EXPERIENCE

- 04/2009–present Coordinator, Collaborative Research Center 673 "Alignment in Communication", U Bielefeld
- 10/2007–present Principal Investigator, Center of Excellence "Cognitive Interaction Technology", U Bielefeld
- 10/2002–03/2009 Managing Director, Center for Interdisciplinary Research (ZiF), U Bielefeld
- 05/1997–06/1997 Visiting Professor, Center for PersonKommunikation (CPK), Aalborg University, Denmark
- 10/1992–03/1993 Visiting Professor, German National Research Center for Information Technology (GMD), Sankt Augustin/Bonn, Germany
- 01/1989–present Professor/chair (C4) of Artificial Intelligence, Faculty of Technology, U Bielefeld
- 10/1988–12/1988 Interim Professor, University of Bielefeld, Germany
- 06/1988–09/1988 Senior Research Scientist and Project Leader (BAT Ia), Dept. of Linguistics and Literature, U Osnabrück, Germany
- 04/1988–05/1988 Assistant Professor (C1), Dept. of Mathematics/Computer Science, University of Osnabrück
- 10/1986–03/1988 Research Fellow in the LILOG group at IBM Deutschland GmbH, Stuttgart, Germany
- 10/1985–09/1986 Assistant Professor (C1), Dept. of Mathematics/Computer Science, University of Osnabrück
- 08/1983–09/1985 Research and Teaching Assistant (A13), Dept. of Mathematics/Computer Science, Univ. of Osnabrück
- 10/1981–07/1983 Assistant Professor, Dept. of Mathematical Sciences, Northern Illinois University, USA
- 01/1978-09/1981 Research and Teaching Assistant (A13), Dept. of Mathematics/Philosophy, Univ. of Osnabrück

MEMBERSHIPS IN SCIENTIFIC SOCIETIES

- 1997 GK - Gesellschaft für Kognitionswissenschaft (German Cognitive Science Society)
- 1987 DGfS - Deutsche Gesellschaft für Sprachwissenschaft (German Society for Linguistics)
- 1981 CSS - Cognitive Science Society
- 1980 AAAI - Association for the Advancement of Artificial Intelligence
- 1978 GI - Gesellschaft für Informatik (German Society for Computer Science)
- 1978 DMV - Deutsche Mathematiker-Vereinigung (German Mathematicians Society)

PROFESSIONAL ACTIVITIES (selected)

- 2009-present Vice-Chairman, Friends and Donors of the Center for Interdisciplinary Research (ZiF), U Bielefeld
- 2008-present Adjoint member and member of managing board, Research Institute for Cognition and Robotics (CoR-Lab), U Bielefeld
- 2007-2009 Scientific Board member, Cognitive Interaction Technology - Center of Excellence, U Bielefeld
- 2006-present Executive board member and from 2009 Coordinator of the Collaborative Research Center "Alignment in Communication" (SFB 673), U Bielefeld
- 2006-present Associate Editor, "Cognitive Processing" (Springer)
- 2005-2007 Moderator, European Cognitive Science Umbrella Group formed at COCSCI2005 in Stresa in preparation of a European Cognitive Science steering group
- 2005-2006 Organizer/leader (with G. Knoblich, Rutgers) of ZiF Research Year on Embodied Communication with 6 associated conferences and workshops
- 2002-2004 External Member of Selection Committee, PhD program in Cognitive Science, University of Osnabrück, Germany
- 2001-2003 President of the German Cognitive Science Society (GK)
- 1997-2003 Executive Board Member of the German Cognitive Science Society (GK)
- 1997-present Founding member and executive committee member of the German-European initiative "Interdisciplinary Colleges Cognitive and Neuro Sciences" (IK)
- 1997-2009 Member of Editorial Board, "Artificial Intelligence Review" (Kluwer; Springer)
- 1996-present Editorial Board, DISKI - Dissertationen zur Künstlichen Intelligenz (Dissertations in Artificial Intelligence), Infix, Sankt Augustin/Akademische Verlagsgesellschaft AKA, Heidelberg
- 1996-1999 Selection Committee, DFG Graduate College "Task-Oriented Communication", U Bielefeld
- 1995-present Advisory Committee, IFF Interdisziplinäres Frauenforschungszentrum (Women & Gender Studies Center), U Bielefeld
- 1993-2005 Executive board member and from 1996 Deputy Speaker of the Collaborative Research Center "Situated Artificial Communicators" (SFB 360), U Bielefeld
- 1993-1996 Coordinator, Section "Artificial Intelligence and Computer Graphics" in the Research Network "Applications of Artificial Intelligence in North-Rhine-Westphalia" (KI-NRW)
- 1991-1992 Dean of the Faculty of Technology, University of Bielefeld
- 1989-1993 Scientific Advisory Board, Zentrum Technologietransfer Biomedizin Bad Oeynhausien
- 1988-1993 Founding member and discussion group leader, VDI (German Engineers Association) Commission on Technology Assessment in AI (funded by the Federal Ministry for Research and Technology)
- 1988-1990 Commissioner for erecting the Computer Science division for the new Faculty of Technology at Bielefeld University and (with R. Giegerich) installing a masters program in "Informatics in the Natural Sciences"
- 1984-1988 International Committee, International Group for the Psychology of Mathematics Education (PME)

PUBLICATIONS

A. BOOKS

- [1] Kopp, S., & Wachsmuth, I. (Eds.) (2010). *Gesture in Embodied Communication and Human-Computer Interaction*. Berlin: Springer (LNAI 5934).
- [2] Wachsmuth, I. & Knoblich, G. (Eds.) (2008). *Modeling Communication with Robots and Virtual Humans*. Berlin: Springer (LNAI 4930).
- [3] Wachsmuth, I., Lenzen, M., & Knoblich, G. (Eds.) (2008). *Embodied Communication in Humans and Machines*. Oxford: Oxford University Press.
- [4] Rickheit, G., & Wachsmuth, I. (Eds.) (2006). *Situated Communication*. Berlin: Mouton de Gruyter.
- [5] Wachsmuth, I., & Sowa, T. (Eds.) (2002). *Gesture and Sign Language in Human-Computer Interaction*. Berlin: Springer (LNAI 2298).
- [6] Wachsmuth, I. & Jung, B. (Eds.) (1999). *KogWis99 - Proceedings der 4. Fachtagung der Gesellschaft für Kognitionswissenschaft*. Sankt Augustin: infix.
- [7] Wachsmuth, I. & Fröhlich, M. (Eds.) (1998). *Gesture and Sign Language in Human-Computer Interaction*. Berlin: Springer (LNAI 1371).
- [8] Wachsmuth, I., Rollinger, C.-R., & Brauer, W. (Eds.) (1995). *KI-95: Advances in Artificial Intelligence*. Berlin Heidelberg New York: Springer (LNAI 981).
- [9] Cremers, A.B., Seetzen, J., & Wachsmuth, I. (Eds.) (1994). *Künstliche Intelligenz - Leitvorstellungen und Verantwortbarkeit (Band 2: Tagungsbericht)*. Düsseldorf: Verein Deutscher Ingenieure VDI.
- [10] Cremers, A.B., Haberbeck, R., Seetzen, J., & Wachsmuth, I. (Eds.) (1992). *Künstliche Intelligenz - Leitvorstellungen und Verantwortbarkeit*. Düsseldorf: Verein Deutscher Ingenieure VDI.
- [11] Wachsmuth, I. (1985). *Mathematische Fertigkeiten und Mathematikverständnis*. Bad Salzdetfurth: Franzbecker.
- [12] Cohors-Fresenborg, E. & Wachsmuth, I. (Eds.) (1978). *Proceedings of the Second International Conference for the Psychology of Mathematics Education*. Osnabrück: OSM.

Book chapters

- [13] Wachsmuth, I. (2010). "Ich, Max" – Kommunikation mit Künstlicher Intelligenz. In T. Sutter & A. Mehler (Eds.), *Medienwandel als Wandel von Interaktionsformen* (pp. 135-157). Wiesbaden: Verlag für Sozialwissenschaften. (First published: UTB, 2005)
- [14] Wachsmuth, I. (2010). MAX – eine Maschine, mit der man sprechen kann. In Fokus Medienarchiv: Reden Realitäten Visionen 1999 bis 2009/Beiträge zur Mediendokumentation, Band 8 (pp. 201-212). Berlin: LIT Verlag. (Reprinted from Info 7, 2009)
- [15] Sowa, T. & Wachsmuth, I. (2009). A computational model for the representation and processing of shape in coverbal iconic gestures. In K. R. Coventry, T. Tenbrink, & J. A. Bateman (Eds.), *Spatial Language and Dialogue* (pp. 132-146). Oxford: Oxford University Press.
- [16] Wachsmuth, I. (2009). Der Avatar Max als virtuelles Phänomen. In Hans Esselborn (Ed.), *Ordnung und Kontingenz: Das kybernetische Modell in den Künsten* (pp. 58-66). Würzburg: Königshausen & Neumann.
- [17] Kopp, S., Wachsmuth, I., Bonaiuto, J., & Arbib, M. (2008). Imitation in embodied communication – from monkey mirror neurons to artificial humans. In I. Wachsmuth, M. Lenzen, & G. Knoblich (Eds.), *Embodied Communication in Humans and Machines* (pp. 357-390). Oxford: Oxford University Press.
- [18] Sowa, T., Kopp, S., Duncan, S., McNeill, D., & Wachsmuth, I. (2008). Implementing a non-modular theory of language production in an embodied conversational agent. In I. Wachsmuth, M. Lenzen, & G. Knoblich (Eds.), *Embodied Communication in Humans and Machines* (pp. 425-450). Oxford: Oxford University Press.
- [19] Wachsmuth, I., Lenzen, M., & Knoblich, G. (2008). Introduction to embodied communication: why communication needs the body. In I. Wachsmuth, M. Lenzen, & G. Knoblich (Eds.), *Embodied Communication in Humans and Machines* (pp. 1-28). Oxford: Oxford University Press.
- [20] Becker, C., Kopp, S., & I. Wachsmuth, I. (2007). Why emotions should be integrated into conversational agents. In T. Nishida (Ed.), *Conversational Informatics: An Engineering Approach* (pp. 49-68). Chichester: John Wiley & Sons.
- [21] Fink, G. A., Fritsch, J., Leßmann, N., Ritter, H., Sagerer, G., Steil, J. J., & Wachsmuth, I. (2006). Architectures of situated communicators: From perception to cognition to learning. In G. Rickheit & I. Wachsmuth (Eds.), *Situated Communication* (pp. 357-376). Berlin: Mouton de Gruyter.

- [22] Kranstedt, A., Lücking, A., Pfeiffer, T., Rieser, H., & Wachsmuth, I. (2006). Deictic object reference in task-oriented dialogue. In G. Rickheit & I. Wachsmuth (Eds.), *Situated Communication* (pp. 155-207). Berlin: Mouton de Gruyter.
- [23] Leßmann, N., Kopp, S., & Wachsmuth, I. (2006). Situated interaction with a virtual human – perception, action, and cognition. In G. Rickheit & I. Wachsmuth (Eds.), *Situated Communication* (pp. 287-323). Berlin: Mouton de Gruyter.
- [24] Wachsmuth, I. (2005). "Ich, Max" – Kommunikation mit künstlicher Intelligenz. In Ch.S. Herrmann, M. Pauen, J.W. Rieger & S. Schicktanz (Eds.), *Bewusstsein: Philosophie, Neurowissenschaften, Ethik* (pp. 329-354). München: Wilhelm Fink Verlag (UTB).
- [25] Wachsmuth, I. (2005). Computersimulationen in der mathematikdidaktischen Grundlagenforschung. In Ch. Kaune, I. Schwank & J. Sjuts (Eds.), *Mathematikdidaktik im Wissenschaftsgefüge – Festschrift für Elmar Cohors-Fresenborg, Band 2* (pp. 179-193). Osnabrück: FMD.
- [26] Jörding, T., & Wachsmuth, I. (2002). An anthropomorphic agent for the use of spatial language. In K.R. Coventry & P. Olivier (Eds.), *Spatial Language: Cognitive and Computational Aspects* (pp. 69-86). Dordrecht: Kluwer.
- [27] Wachsmuth, I. (2002). Communicative rhythm in gesture and speech. In: P. Mc Kevitt, S. O'Nuáallain & C.Mulvihill (Eds.), *Language, Vision and Music* (pp. 117-132). Amsterdam: Benjamins. (Reprinted by permission of Springer-Verlag.)
- [28] Jung, B., Hoffhenke, M., Lenzmann, B., & Wachsmuth, I. (2000). Interaktive Montagesimulation in virtuellen Umgebungen. In H. Szczerbicka und T. Uthmann (Eds.): *Modellierung, Simulation und Künstliche Intelligenz* (pp. 193-210). Delft: SCS European Publishing House.
- [29] Wachsmuth, I. (2000). The concept of intelligence in AI. In H. Cruse, J. Dean, & H. Ritter (Eds.), *Prerational Intelligence - Adaptive Behavior and Intelligent Systems without Symbols and Logic, Vol. 1* (pp. 43-55). Dordrecht, The Netherlands: Kluwer Academic Publishers.
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- [31] Wachsmuth, I. & Jung, B. (1996). Dynamic conceptualization in a mechanical-object assembly environment. In P. Mc Kevitt (Ed.), *Integration of Natural Language Processing and Vision Processing, Vol. IV* (pp. 191-214). Dordrecht: Kluwer. Reprinted from *Artificial Intelligence Review* 10(3-4).
- [32] Görz, G. & Wachsmuth, I. (1995). Einleitung zu G. Görz (Ed.), *Einführung in die Künstliche Intelligenz, 2. Aufl.* (pp.1-13). Bonn: Addison-Wesley.
- [33] Meyer-Fujara, J., Puppe, F., & Wachsmuth, I. (1995). Expertensysteme und Wissensmodellierung. In G. Görz (Ed.), *Einführung in die Künstliche Intelligenz, 2. Aufl.* (pp. 705-753). Bonn: Addison-Wesley.
- [34] Wachsmuth, I. & Cao, Y. (1995). Interactive graphics design with situated agents. In W. Strasser & F. Wahl (Eds.), *Graphics and Robotics* (pp. 73-85). Berlin Heidelberg New York: Springer.
- [35] Wachsmuth, I. & Meyer-Fujara, J. (1994). Wissensbasierte Informationsverarbeitung mit Expertensystemen. In H. Best, B. Endres-Niggemeyer, M. Herfurth & H.P.Ohly (Eds.), *Informations- und Wissensverarbeitung in den Sozialwissenschaften* (pp. 103-113). Opladen: Westdeutscher Verlag.
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- [39] Görz, G., Kremeier, A., Röpke, H., Schreiber, P., Strube, G., Wachsmuth, I., & Wilker, M. (1992). Mögliche Auswirkungen einer entwickelten KI auf Arbeits- und Lebenswelt. In A.B. Cremers et al. (Eds.) *Künstliche Intelligenz - Leitvorstellungen und Verantwortbarkeit* (pp. 156-170). Düsseldorf: Verein Deutscher Ingenieure VDI.
- [40] Wachsmuth, I. & Wilker, M. (1992). Zukunftsauswirkungen der Künstlichen Intelligenz – Einführung und Übersicht. In A.B. Cremers, R. Haberbeck, J. Seetzen & I. Wachsmuth (Eds.) *Künstliche Intelligenz - Leitvorstellungen und Verantwortbarkeit* (pp. 138-142). Düsseldorf: Verein Deutscher Ingenieure VDI.
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- [42] Wachsmuth, I. (1988). Modeling the knowledge base of mathematics learners: Situation-specific and situation-nonspecific knowledge. In H. Mandl & A. Lesgold (Eds.), *Learning Issues for Intelligent Tutoring Systems* (pp. 63-79). New York: Springer.
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- [44] Wachsmuth, I. (1986). Logische Analyse kognitiver Organisationsstrukturen – Anwendung eines Wissensrepräsentationsmodells zur Erklärung mathematischen Verhaltens. In H. G. Steiner (Ed.), *Grundfragen der Entwicklung mathematischer Fähigkeiten* (pp. 217-228). Köln: Aulis.
- [45] Wachsmuth, I. (1985). LAKOS - Ein Modell der Wissensrepräsentation zur Erklärung kognitiven Verhaltens. In H. Mandl & P. M. Fischer (Eds.), *Lernen im Dialog mit dem Computer* (pp. 24-39). München: Urban und Schwarzenberg.

B. JOURNAL PAPERS

- [46] Becker-Asano, C., & Wachsmuth, I. (2010). Affective computing with primary and secondary emotions in a virtual human. *Journal of Autonomous Agents and Multi-Agent Systems*, 20 (1), 32-49.
- [47] Pfeiffer, T., Latoschik, M.E., & Wachsmuth, I. (2009). Evaluation of binocular eye trackers and algorithms for 3D gaze interaction in virtual reality environments. *Journal of Virtual Reality and Broadcasting* 5(2008), no. 16, January 2009, urn:nbn:de:0009-6-16605.
- [48] Wachsmuth, I. (2009). MAX – eine Maschine, mit der man sprechen kann. *Info* 7, 24(3), 2-7.
- [49] Becker, C., Kopp, S., Pfeiffer-Leßmann, N., & Wachsmuth, I. (2008). Virtual humans growing up: From primary toward secondary emotions. *Künstliche Intelligenz*, 1/2008, 23-27.
- [50] Kopp, S., Bergmann, K., & Wachsmuth, I. (2008). Multimodal communication from multimodal thinking – towards an integrated model of speech and gesture production. *International Journal of Semantic Computing*, 2 (1), 115-136.
- [51] Rickheit, G. & Wachsmuth, I. (2008). Alignment in communication – Collaborative Research Center 673 at Bielefeld University. *Künstliche Intelligenz*, 2/2008, 62-65.
- [52] Wachsmuth, I. (2006). Der Körper spricht mit. *Gehirn & Geist* Nr. 4/2006, 40-47 (Titel).
- [53] Wachsmuth, I. (2006). Gestures Offer Insight. *Scientific American Mind* Vol. 17 No. 5, 20-25.
- [54] Wachsmuth, I., & Knoblich, G. (2005). Embodied communication in humans and machines. *AI Magazine*, 26 (2), 85-86.
- [55] Wachsmuth, I. & Knoblich, G. (2005). Embodied communication in humans and machines – a research agenda. *Artificial Intelligence Review*, 24 (3-4), 517-522.
- [56] Kopp, S., & Wachsmuth, I. (2004). Synthesizing multimodal utterances for conversational agents. *Journal of Computer Animation and Virtual Worlds*, 15, 39-52.
- [57] Kopp, S., Jung, B., Lessmann, N., & Wachsmuth, I. (2003). Max – a multimodal assistant in virtual reality construction. *Künstliche Intelligenz*, 4/2003, 11-17.
- [58] Jung, B., Kopp, S., Latoschik, M., Sowa, T., Wachsmuth, I. (2000). Virtuelles Konstruieren mit Gestik und Sprache. *Künstliche Intelligenz*, 2/2000, 5-11.
- [59] Wachsmuth, I. (2000). Kommunikative Rhythmen in Gestik und Sprache. *Kognitionswissenschaft*, 8(4), 151-159.
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- [61] Wachsmuth, I. & Rickheit, G. (Journal issue eds.) (1999). *Kognitionswissenschaft* 8 (3), (Leitthema "Situierete Künstliche Kommunikatoren), Springer 1999.
- [62] Behr, M.J., Wachsmuth, I., & Post, T. (1998). Rational number learning aids: Transfer from continuous models to discrete models (selected for retrospective reprint from *Focus* 10(4), 1988, 1-18). *Focus on Learning Problems in Mathematics* 20(1), 63-81.
- [63] Rickheit, G. & Wachsmuth, I. (1996). Collaborative Research Centre "Situating Artificial Communicators" at the University of Bielefeld, Germany. *Artificial Intelligence Review*, 10(3-4), 1996, 65-170.
- [64] Wachsmuth, I. & Jung, B. (1996). Dynamic conceptualization in a mechanical-object assembly environment. *Artificial Intelligence Review*, 10(3-4), 1996, 345-368.
- [65] Antoniou, G. & Wachsmuth, I. (1994). Structuring and modules for knowledge bases: Motivation for a new model. *Knowledge-Based Systems*, 7 (1), 49-51.
- [66] Wachsmuth, I., Krüger, W., & Cao, Y. (1994). Virtuelle Räume. *Künstliche Intelligenz*, 1/1994, 26-33.
- [67] Behr, M.J., Wachsmuth, I., & Post, T. (1988). Rational number learning aids: Transfer from continuous models to discrete models. *Focus on Learning Problems in Mathematics*, 10 (4), 1-18.
- [68] Bright, G.W., Behr, M.J., Post, T.R., & Wachsmuth, I. (1988). Identifying fractions on number lines. *Journal for Research in Mathematics Education*, 19 (3), 215-232.

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- [76] Wachsmuth, I. (1983). Locally synchronous cellular automata. *Acta Cybernetica* 6 (1), 55-78.
- [77] Wachsmuth, I. (1982). Kalküle, Spiele und Lernen. *Der Mathematik-Unterricht* 6/82, 6-17.
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C. CONFERENCE PAPERS

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- [82] Fröhlich, C., Biermann, P., Latoschik, M. E., & Wachsmuth, I. (2009). Processing iconic gestures in a multimodal virtual construction environment. In M. Dias, S. Gibet, M. M. Wanderley, R. Bastos (Eds.), *Gesture-Based Human-Computer Interaction and Simulation* (pp. 187-192). Berlin: Springer (LNAI 5085).
- [83] Fröhlich, C., Wachsmuth, I., & Latoschik, M. E. (2009). Virtuelle Werkstatt - Multimodale Interaktion für intelligente virtuelle Konstruktion. In J. Gausemeier, M. Grafe (Eds.), *8. Paderborner Workshop Augmented & Virtual Reality in der Produktentstehung* (pp. 241-255). Paderborn: HNI.
- [84] Nguyen, N., & Wachsmuth, I. (2009). Modeling peripersonal action space for virtual humans using touch and proprioception. In Zs. Ruttkey, M. Kipp, A. Nijholt, & H. H. Vilhjalmsón (Eds.), *Proceedings of the 9th Conference on Intelligent Virtual Agents* (pp. 63-75). Berlin: Springer (LNAI 5773).
- [85] Nguyen, N., & Wachsmuth, I. (2009). Modeling peripersonal action space for a virtual human by learning a tactile body schema. In B. Mertsching, M. Hund, & Z. Aziz (Eds.), *KI 2009: Advances in Artificial Intelligence* (pp. 516-523). Berlin: Springer (LNAI 5803).
- [86] Pfeiffer-Lessmann, N., & Wachsmuth, I. (2009). Formalizing joint attention in cooperative interaction with a virtual human. In B. Mertsching, M. Hund, & Z. Aziz (Eds.), *KI 2009: Advances in Artificial Intelligence* (pp. 540-547). Berlin: Springer (LNAI 5803).
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