Dr. Jürgen Steimle
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An den Dekan der Fakultät 4
Univ.-Prof. Dr. Ullrich Pietsch
Universität Siegen
57068 Siegen

dekanat@nt.uni-siegen.de

April 28, 2015

Professor position "Ubiquitous Computing" (W3)

Dear Professor Pietsch,

Please find enclosed my documents in application for the open full professor position in Ubiquitous Computing at your department.

I am currently an Independent Research Group Leader (W2) at the Max Planck Institute for Informatics and Saarland University, where I head a group on "Embodied Interaction". In a short period of time, I could establish an internationally visible and well connected group (publishing at the first-tier conferences and distinguished with several research awards). I am active in teaching in the Computer Science and Media Informatics curricula, with very positive results in student evaluations.

My research deeply integrates new technologies for sensing/output with new interactive media. Therefore the advertised position offers an ideal environment for my future research and teaching, with excellent opportunities to engage in on-site collaboration at both departments 3 and 4, at ZESS, within the research training groups on Imaging New Modalities and Locating Media, with regional industry and with maker spaces. In my positioning statement I have outlined how I intend to contribute to further strengthening the outstanding profile of the University of Siegen.

Should you require further information about my qualifications I would be pleased to quote references.

I would be delighted to be invited to an interview and look forward to hearing from you.

Yours sincerely,

Attachments:

- Curriculum vitae
- List of publications
- List of third-party funded projects
- Research Statement
- Teaching Statement
- Copies of degrees

DR. JÜRGEN STEIMLE

Independent Research Group Leader, Cluster of Excellence MMCI
Max Planck Institute for Informatics and Saarland University

Address	Scheidter Str. 135, 66123 Saarbrücken, Germany
E-mail	jsteimle@mpi-inf.mpg.de
URL	http://embodied.mpi-inf.mpg.de
DOB	11 March 1980
Nationality	German
Marital Status	Married, 2 children

EDUCATION

07/2006 – 06/2009	**Ph.D. in Computer Science with Distinction** (summa cum laude) Technische Universität Darmstadt, Germany SUPERVISORS: Max Mühlhäuser (TU Darmstadt) and Jan Borchers (RWTH Aachen) THESIS: Integrating Printed and Digital Documents: Interaction Models and Techniques for Collaborative Knowledge Work
10/2000 – 05/2006	**Computer Science and French Studies; State Exam with Distinction** (Grade 1.2; top 5%) University of Freiburg, Germany THESIS: Computational Mechanism Design for Robust Distributed Algorithms and Protocols
10/2000 – 02/2002	**Public Law, Pre-Degree** (Grade 9; top 10%) University of Freiburg, Germany
06/1999	**University Entrance Diploma (Abitur) with Distinction** (Grade 1.0; top 1%) Theodor-Heuss-Gymnasium Aalen/Württ., Germany

RESEARCH ACTIVITIES

01/2013 – Present	**Independent Research Group Leader (W2)** Max Planck Institute for Informatics and Saarland University Cluster of Excellence "Multimodal Computing and Interaction" *(Fully independent junior faculty position with full PhD supervision privileges; funding comparable to an associate professor position)*
01/2013 – Present	**Principal Investigator** Saarland Graduate School of Computer Science
02/2013 – 05/2014	**Research Affiliate (Adjunct Appointment)** Massachusetts Institute of Technology, Media Lab
01/2012 – 01/2013	**Visiting Assistant Professor** Massachusetts Institute of Technology, Media Lab
07/2009 – 12/2011	**Head of the research area "Tangible User Interfaces"** Technische Universität Darmstadt, Telecooperation Division, Department of Computer Science
04/2010	**Visiting Researcher** University of California, San Diego (Prof. James D. Hollan)
11/2007	**Visiting Researcher** Stanford University (Prof. Scott Klemmer)
07/2006 – 06/2009	**Research Assistant** Technische Universität Darmstadt

HONORS AND AWARDS

2015	**ACM CHI 2015** Best Paper Award (top 1%)
	ACM CHI 2015 Best Paper Honorable Mention Award (top 5%)
2014	**ACM UIST 2014** Best Paper Award (top 1%)
	MIT Technology Review International List of Innovators Under 35 Finalist (I have been chosen as one of the top 80 innovators)
2013	**ACM CHI 2013** Best Paper Honorable Mention Award (top 5%)
2010	**GI Computer Science Dissertation Award 2009** of the German Informatics Society (GI), the Swiss Informatics Society (SI), the Austrian Computer Society (OCG) and the German Chapter of the ACM. This is the most prestigious award for computer science dissertations in Germany, Austria and Switzerland.
	ACM EICS 2010 Honorable Mention Award
2009	**European eLearning Award 2009** Finalist
2008	**IEEE ICALT 2008** Outstanding Full Paper Award
2007	**DeLFI 2007** Best Paper Award
2004 – 2006	**SAP Fellowship** Member of the SAP FastTrack Internship Program
2002 – 2006	**German National Merit Foundation (Studienstiftung des deutschen Volkes)** Full scholarship for undergraduate and graduate studies (top 0.5 % of students at German universities)

PROFESSIONAL SERVICE

CHAIRING, ORGANIZATION, EDITORSHIPS	**ACM CHI 2015** Workshops Co-chair
	ACM CHI 2015 Associate Chair for Papers and Notes
	GI Fachgruppe Be-greifbare Interaktion [Special Interest Group on Tangible Interaction of the German Informatics Society], Organizer of the 6th yearly workshop, Saarbrücken 2015 (Keynote: Wendy Mackay, Univ. Paris)
	CeBIT 2015 Trade Show Co-organizer of the booth of Saarland University Computer Science (HCI focus area with four stands)
	ACM CHI 2014 Workshops Co-chair
	ACM CHI 2014 Associate Chair for Papers and Notes
	MobileHCI 2014 Workshops Co-chair
	ACM ITS 2014 Doctoral Consortium Co-Chair
	Informatik Spektrum Guest Editor of Special Issue (5)2014 “Interaction Beyond the Desktop” (with Eva Hornecker and Albrecht Schmidt)
	CHI 2013 Workshop Co-organizer “Displays Take New Shape: An Agenda for Future Interactive Surfaces” (with Hrvoje Benko, Alvaro Cassinelli, Hiroshi Ishii, Daniel Leithinger, Pattie Maes, and Ivan Poupyrev)
	CHI 2013 Special Interest Group Co-organizer “Visions and Visioning in CHI” (with Aaron Quigley, Wendy Mackay, and Hiroshi Ishii)
	Dagstuhl seminar Co-organizer “Interaction Beyond the Desktop” 2012 (with Alan Dix, James D. Hollan, and Albrecht Schmidt)
	ACM ITS 2012 Demos Co-chair
	ACM ITS 2012 Tutorial & Workshop Co-organizer “Beyond Flat Displays: Towards Shaped and Deformable Interactive Surfaces” (with Pattie Maes, Daniel Leithinger, Pol Pla, Hrvoje Benko)

	MIT Media Lab Members Week 2012, Workshop Co-organizer "New Shapes for Displays" (with Pattie Maes, Hiroshi Ishii, Pol Pla i Conesa, and Daniel Leithinger)
	Mensch & Computer 2010 Tangible Interaction workshop Co-organizer "Be-greifbare Interaktionen" 2010 (with Bernd Robben and Johann Habakuk Israel)
PROGRAM COMMITTEES	**ACM CHI** Conference on Human Factors in Computing, 2014 and 2015
	ACM UIST User Interface Software and Technology Symposium, 2015
	ACM MM Intl. Conference on Multimedia, 2013
	ACM ITS, Conf. on Interactive Tabletops and Surfaces, 2010, 2011, 2014
	ACM TEI, Intl. Conf. on Tangible, Embedded and Embodied Interaction, 2013
	Mensch und Computer [German-speaking CHI conference] 2013, 2014, 2015
	PerDis Intl. Symposium on Pervasive Displays 2014 and 2015
	AH Conference on Augmented Human 2013 and 2015
	ACM CHI Workshops Track, 2013
	ACM IUI Demos and Posters Track, 2013
	Workshops: CHI Workshop on Assistive Augmentation 2014, WAVe Workshop 2013, Be-greifbare Interaktionen Workshop 2012 and 2013, Physicality Workshop 2012, UbiComp PaperComp Workshop 2010, IEEE MTEL Workshop, 2009, 2010, 2011, 2012, 2013
OTHER BOARDS	Expert Member of **BMBF** [German national ministry of research] **Think Tank** "Human-Technology Interaction" (since 2015)
	Member of selection committees of the **German National Merit Foundation** (Studienstiftung des deutschen Volkes) (2008 – 2010)
REVIEWER	EU FET Open Project (on-site), ERC Grants, ACM CHI, ACM UIST, UbiComp, ACM CSCW, ACM Multimedia, ACM ITS, MobileHCI, TEI, J. Personal and Ubiquitous Computing, J. Human-Computer Studies, J. Interacting with Computers, J. Educational Technology & Society …
MEMBER	ACM, SIGCHI, Gesellschaft für Informatik, Deutscher Hochschulverband

SUPERVISION OF STUDENTS

ONGOING DISSERTATIONS	Simon Olberding (Saarland University, 2012–), working title: "Ad-Hoc Customization of Interactive Surfaces"
	Martin Weigel (Saarland University, 2013–), working title: "On-Body Interactive Surfaces"
	Daniel Gröger (Saarland University, 2014–), working title: "Digital Fabrication of Interactive Objects"
	Myroslav Bachynskyi (Saarland University, 2014–), working title: "Analyzing Performance and Ergonomics of User Interfaces Through Biomechanical Simulation", Co-supervisor with Antti Oulasvirta (Aalto University)
COMPLETED DISSERTATIONS	Mohammadreza Khalilbeigi (TU Darmstadt, 2014): "Physical Interaction Concepts for Knowledge Work Practices", Co-supervisor (Zweitgutachter) with Max Mühlhäuser
	Roman Lissermann (TU Darmstadt, 2014): "Novel Devices and Interaction Concepts for Fluid Collaboration", Co-supervisor with Max Mühlhäuser
	Jochen Huber (TU Darmstadt, 2012): "Mobile Interaction with Large Multimedia Information Spaces", Co-supervisor with Max Mühlhäuser
	Nan-Wei Gong (MIT Media Lab, 2013), "Design and Applications of Inkjet-Printed Flexible Sensate Surfaces", PhD thesis committee (Zweitgutachter) with Joe Paradiso and Pattie Maes
M.SC. THESES	Sergio Soto (2014 – ongoing), Michael Wessely (2015), Nirzaree Vadgama (2014), Nisa Bozkurt (2014), Vikram Mehta (2014), John Tiab (2014), Wolfgang Kleine (2012), Patrik Schmittat (2012), Simon Olberding (2010), Roman Lissermann (2010), Nadege Zatcha ('09), Jie Zhou ('08)

B.SC. THESES	Martin Schmitz (2011), Jan Riemann (2010), Dima Burlak (2010), Martin Weigel (2010), Sebastian Ehmke (2010), Michael Stieler (2008), Stefan Buhrmester (2008), Sasa Vukancic (2008), Simon Olberding (2007), Roman Lissermann (2007)
STUDY THESES	Jan Riemann (2010), Stephan Mehlhase (2007), Jens Pfau (2007)

TEACHING

01/2015	**Lecture "Perspectives of Computer Science"**, Guest lecturer Saarland University, Computer Science Department
04/2014 – 09/2014	**Lecture "User Interface Design"**, Co-lecturer (with Antonio Krüger and Sven Gehring) Saarland University, Computer Science Department
04/2014 – 09/2014	**Seminar "Developing Embedded Interactive Systems with the Arduino Microcontroller"**, Lecturer Saarland University, Computer Science Department *Evaluated top 4 of all 43 courses in Saarland U Computer Science; top 2 seminar*
04/2013 – 07/2013	**Lecture "User Interface Design"**, Co-lecturer (with Antonio Krüger) Saarland University, Computer Science Department
02/2013 – 03/2013	**Seminar "Embodied Interaction"**, Lecturer Saarland University, Computer Science Department
02/2012 – 05/2012	**Lecture MAS 672 "New Paradigms in Human Computer Interaction"** (Pattie Maes/Hiroshi Ishii)**,** Guest Lecturer Massachusetts Institute of Technology, Media Lab
10/2010 – 03/2011	**Lecture "Human-Computer Interaction"**, Lecturer Darmstadt University of Technology, Computer Science Department *Evaluated top 5 of all 40 lectures in TU Darmstadt Computer Science*
10/2010 – 03/2011	**Lab Course "Advanced User Interfaces"**, Co-lecturer Darmstadt University of Technology, Computer Science Department
10/2009 – 04/2010	**Seminar "Innovation Seminar Telecooperation"**, Co-lecturer Darmstadt University of Technology, Computer Science Department
10/2009 – 04/2010	**Lab Course "Interaction Techniques for Tabletops"**, Co-lecturer Darmstadt University of Technology, Computer Science Department
04/2009 – 09/2009	**Lab Course "Multi-Touch Interaction for 3D Environments"**, Co-lecturer Darmstadt University of Technology, Computer Science Department
04/2008 – 01/2009	**Lab Course "Design of Paper-centric User Interfaces"**, Lecturer Darmstadt University of Technology, Computer Science Department
04/2007 – 07/2007	**Research Seminar "eLearning"**, Co-lecturer Darmstadt University of Technology, Computer Science Department
12/2002 – 03/2003	**German language**, Teaching Assistant at French High school Lycée Jean Paul Sartre, Lyon, France

INVITED TALKS

2015	**Lancaster University**, School of Computing and Communication TITLE: Digital Fabrication of Interactive Objects and Surfaces
2014	**Keynote at EU COST Action "New possibilities for print media and packaging – combining print with digital"**, Montegrotto, Italy TITLE: Sensitive Paper
	Max Planck Institutes for Informatics and Software Technology, Joint Lecture TITLE: Beyond Multi-Touch: User Interfaces for Flexible Displays and Surfaces

University of Stuttgart, Department of Computer Science
TITLE: The Future is Flexible: User Interfaces for Flexible Displays and Surfaces

University of Munich (LMU), Department of Computer Science
TITLE: Printed Sensors for Interactive Surfaces

Karlsruhe Institute of Technology, Department of Computer Science
TITLE: Flexible Thin-film Sensors for Interactive Surfaces in Ubicomp Environments

University of Konstanz, Department of Computer Science
TITLE: Printed Sensors for Interactive Surfaces

2013 **University of Copenhagen**, Department of Computer Science
TITLE: Interacting with Flexibility: Interfaces for Paper-like Displays

Merck Chemicals, Displaying Future Division, Darmstadt, Germany
TITLE: How Upcoming Display Technologies Will Change Computer Devices

TU Darmstadt, Keynote at the Workshop of the German SIG on Tangible Interaction
TITLE: Tangible Projection

2012 **Wellesley College**, HCI Lab
TITLE: Paper and Interactive Surfaces

Massachusetts Institute of Technology, Media Lab
TITLE: Interactions for Rollable, Foldable, and Stackable Displays

2011 **Massachusetts Institute of Technology, Media Lab**
TITLE: Paper User Interfaces

University of Calgary, iLab
TITLE: Paper and Interactive Surfaces

Technische Universität Darmstadt, Institute of Philosphy
TITLE: Is Human-Computer Interaction a Technoscience?

Saarland University, German Cluster of Excellence "Multimodal Computing and Interaction",
TITLE: Tangible Interaction for Knowledge Work

2010 **University of Toronto**, Dynamic Graphics Project
TITLE: Paper-based interactions for knowledge work

University of California, San Diego, Distributed Cognition and HCI Group
TITLE: Integrating Printed and Digital Documents

2009 **Technische Universität Darmstadt**, World Usability Day, German Section of the Usability Professionals Association,
TITLE: Human-Computer-Interaction beyond the desktop

University of Magdeburg, User Interface and Software Engineering Group
TITLE: Pen-and-Paper User Interfaces: Advanced Concepts for Integrating Printed and Digital Documents

2008 **Technische Universität Dresden**, World Usability Day, German Section of the Usability Professionals Association
TITLE: Paper-centric Interaction Concepts for Collaborative Document Work

SAP Research, Darmstadt
TITLE: Combining Paper-centric and Digital Interactions in Knowledge Work

PATENTS

2013 Technique for real-time-capable estimation of materials and for material-based image segmentation in electronic image sequences *[Verfahren zur echtzeitfähigen Materialschätzung und zur materialbasierten Bildsegmentierung in elektronischen Bildsequenzen]*, European Patent requested on 9 April 2013

SELECTED PRESS COVERAGE

2015	**Popular Science**, "Control your smartphone with stickers on your skin", 04 March 2015
	Discovery Channel, Daily Planet, 12 March 2015, reports on our project Biomechanical Simulation
	Deutschlandfunk, German national public radio, Wissenschaft im Brennpunkt, „Elektronik passt sich an: Biegen statt brechen", 26 April 2015
	ACM TechNews, "Flexible Sensors Turn Skin Into a Touch-Sensitive Interaction Space for Mobile Devices", 6 March 2015
	E&T Engineering and Technology Magazine, "Touch-sensitive skin sensors to operate mobile devices", 4 March 2015
2014	**The Guardian**, "Could nanoprinting kick-start a world of versatile home manufacturing?", 10 Feb 2014
	ARD/BR Alpha, German national science TV channel, Campus Magazin, 5 May 2014
	Deutschlandfunk, German national public radio, Computer and Communication, 18 Oct 2014
	Sensor Magazin, "Im Hobbykeller drucken: Hauchdünne berührungsempfindliche Displays auf vielen Materialien", p. 36, 5 (November) 2014
	Elektronik – Fachmedium für industrielle Anwender und Entwickler, „Individuelle Displays zu Hause drucken", p, 16, 22 (November) 2014
2013	**New Scientist**, "Print a working paper computer on an $80 inkjet", Print magazine issue 2937, p. 19, 5 Oct 2013
	KEM Konstruktion Entwicklung Management Magazine, „Berührungsempfindliche Elektronik mit der Schere zurechtschneiden", p. 60, 11-2013
2012	**New Scientist**, One Per Cent, 3 Feb 2012
	Engadget, 21 Feb 2012
2011-2015	More than 200,000 views of my research videos on Youtube

LANGUAGES

German (native), English (fluent), French (fluent)

April 2015

PEER-REVIEWED CONFERENCE PAPERS [1]

C30. Martin Weigel, Tong Lu, Gilles Bailly, Antti Oulasvirta, Carmel Majidi, Jürgen Steimle: "**iSkin: Flexible, Stretchable and Visually Customizable On-Body Touch Sensors for Mobile Computing**", *Proc. ACM Intl. Conf. Human Factors in Computing CHI'15*, p. 2991-3000, ACM Press, 2015 (Full Paper) [acceptance rate: 23%, **Best Paper Award** (Top 1%)]

C29. Myroslav Bachynskyi, Gregorio Palmas, Antti Oulasvirta, Jürgen Steimle, Tino Weinkauf: "**Performance and Ergonomics of Touch Surfaces: A Comparative Study using Biomechanical Simulation**", *Proc. ACM Intl. Conf. Human Factors in Computing CHI'15,* p. 1817-1826, ACM Press, 2015 (Full Paper) [acceptance rate: 23 %, **Best Paper Honorable Mention Award** (Top 5%)]

C28. Simon Olberding, Suranga Nanayakkara, Pattie Maes, Jürgen Steimle: "**CloudDrops: Stamp-sized Pervasive Displays for Situated Awareness of Web-based Information**", *Proc. Intl. Symposium on Pervasive Displays*, ACM Press (Full Paper) (to appear).

C27. Simon Olberding, Michael Wessely, Jürgen Steimle: "**PrintScreen: Fabricating Highly Customizable Thin-film Touch-Displays**"**,** *Proc. ACM UIST'14,* p. 281-290, ACM Press, 2014 (Full Paper) [acceptance rate: 22.2%, **Best Paper Award** (Top 1%)]

C26. Martin Weigel, Vikram Mehta, Jürgen Steimle: "**More Than Touch: Understanding How People Use Skin as an Input Surface for Mobile Computing**", *Proc. ACM Intl. Conf. Human Factors in Computing CHI'14*, p. 179-188, ACM Press, 2014 (Full Paper) [acc. rate: 22.8%]

C25. Roman Lissermann, Jochen Huber, Martin Schmitz, Jürgen Steimle, Max Mühlhäuser: "**Permulin: Mixed-Focus Collaboration on Multi-View Tabletops**" , *Proc. ACM Intl. Conf. Human Factors in Computing CHI'14*, p, 3191-3200, ACM Press, 2014 (Full Paper) [acceptance rate: 22.8%]

C24. Nan-Wei Gong, Jürgen Steimle, Simon Olberding, Steve Hodges, Nicholas Gillian, Yoshihiro Kawahara, Joe Paradiso: "**PrintSense: A Versatile Sensing Technique to Support Multimodal Flexible Surface Interaction**" , *Proc. ACM Intl. Conf. Human Factors in Computing CHI'14*, p. 1407-1410, ACM Press, 2014 (Short Paper) [acceptance rate of short papers: 13 %]

C23. Jifei Ou, Lining Yao, Daniel Tauber, Jürgen Steimle, Hiroshi Ishii : "**jamSheets: Thin Stiffness Tunable Interfaces Using Layer Jamming Mechanism**", *Proc. Intl. Conference on Tangible, Embedded and Embodied Interaction (TEI'14)*, p. 65-72, ACM Press, 2014. (Full Paper) [acceptance rate: 27 %]

C22. Mohammadreza Khalilbeigi, Jürgen Steimle, Jan Riemann, Niloofar Dezfuli, Max Mühlhäuser, James D. Hollan: "**ObjecTop: Occlusion Awareness of Physical Objects on Interactive Tabletops**", *Proc. ACM International Conference on Interactive Tabletops and Surfaces (ITS'13)*, p. 255-264, ACM Press, 2013 (Full Paper) [acceptance rate: 29 %]

[1] In my research field, publications at the premier conferences are internationally regarded equal, if not superior, to publications in top HCI journals. The acceptance rate of archival publications at ACM CHI, ACM UIST and ACM Multimedia is around 20 %. Mobile HCI, ITS, TEI and ICALT are the leading venues for mobile interfaces, interactive displays, tangible interfaces, and learning systems respectively, and have competitive acceptance rates of 25 – 40 %. Papers are fully reviewed and considered terminal publications.

C21. Simon Olberding, Nan-Wei Gong, John Tiab, Joseph Paradiso, Jürgen Steimle: "**A Cuttable Multi-touch Sensor**", *Proc. ACM UIST'13,* p. 245-254, ACM Press, 2013 (Full Paper) [acceptance rate: 20 %]

C20. Jürgen Steimle, Andreas Jordt, Pattie Maes: "**Flexpad: Highly Flexible Bending Interactions for Projected Handheld Displays**", *Proc. ACM Intl. Conf. Human Factors in Computing CHI'13,*p. 237-246, ACM Press, 2013 (Full Paper) [acceptance rate: 20 %, **Best Paper Honorable Mention Award** (Top 5%)]

C19. Martin Weigel, Sebastian Boring, Jürgen Steimle, Nicolai Marquardt, Saul Greenberg, Anthony Tang: "**ProjectorKit: Easing Rapid Prototyping of Interactive Applications for Mobile Projectors**", *Proc. MobileHCI 2013,* p. 247-250, ACM Press, 2013 (Short Paper) [acceptance rate: 22 %]

C18. Simon Olberding, Kian Peen Yeo, Suranga Nanayakkara, Jürgen Steimle: "**AugmentedForearm: Exploring the Design Space of a Display-enhanced Forearm**", *Proc. 4th Intl. Conf. on Augmented Human (AH'13)*, p. 9-12, ACM Press, 2013 (Short Paper) [acceptance rate: 45 %]

C17. Roman Lissermann, Simon Olberding, Max Mühlhäuser, Jürgen Steimle: "**PaperVideo: Multiple Videos In Physical Space**", p. 129-138, *Proc. ACM Multimedia 2012* (Full Paper) [acceptance rate: 20 %]

C16. Jürgen Steimle, Simon Olberding: "**When Mobile Phones Expand Into Handheld Tabletops**", *Proc. ACM Intl. Conf. Human Factors in Computing (CHI 2012) alt.chi*, p. 271-280, ACM Press, 2012. [acceptance rate: 47 %, our contribution within top 5 % of submissions]

C15. Mohammadreza Khalilbeigi, Roman Lissermann, Wolfgang Kleine, Jürgen Steimle: "**FoldMe: Interacting with Dual-sided Foldable Displays**". *Proc. Sixth Intl. Conference on Tangible, Embedded and Embodied Interaction (TEI'12)*, p. 33-40, ACM Press, 2012 (Full Paper). [acceptance rate: 31 %]

C14. Jochen Huber, Jürgen Steimle, Max Mühlhäuser: "**LightBeam: Interacting with Augmented Real-World Objects in Pico Projections**", *Proc. 11th Intl. Conf. Mobile and Ubiquitous Multimedia (MUM 2012),* p. 16:1 – 16:10, ACM Press, 2012 (Full Paper) [acceptance rate: 35 %]

C13. Mohammadreza Khalilbeigi, Roman Lissermann, Max Mühlhäuser, Jürgen Steimle: "**Xpaaand: Interaction Techniques for Rollable Displays**", *Proc. ACM Intl. Conf. Human Factors in Computing (CHI 2011)*, p. 2729-2732, ACM Press, 2011 (Short Paper) [acceptance rate: 20 %]

C12. Jochen Huber, Jürgen Steimle, Max Mühlhäuser: "**A Model of Embodied Dynamic Peephole Pointing for Hidden Targets**", p. 315-320, *Proc. HCI 2011* (Short Paper).

C11. Jochen Huber, Jürgen Steimle, Max Mühlhäuser: "**Towards More Efficient User Interfaces for Mobile Video Browsing: An In-Depth Exploration of the Design Space**", *Proc. ACM Multimedia 2010,* p. 341-350, ACM Press, 2010 (Full Paper) [acceptance rate: 16 %]

C10. Jürgen Steimle, Mohammadreza Khalilbeigi, Max Mühlhäuser, James D. Hollan: "**Physical and Digital Media Usage Patterns on Interactive Tabletop Surfaces**", *Proc. ACM International Conference on Interactive Tabletops and Surfaces 2010 (ITS 2010)*, p. 167-176, ACM Press, 2010 (Full Paper) [acceptance rate: 28 %]

C9. Felix Heinrichs, Jürgen Steimle, Daniel Schreiber, Max Mühlhäuser: „**Letras: An Architecture and Framework for Ubiquitous Pen-and-Paper Interaction**", *Proc. ACM SIGCHI Symposium on Engineering Interactive Computing Systems (EICS 2010),* p. 193-198, ACM Press, 2010 (Short Paper, **Honorable Mention Award**) [acceptance rate: 29 %]

C8. Jochen Huber, Jürgen Steimle, Max Mühlhäuser: "**Wipe'n'Watch: Spatial Interaction Techniques for Interrelated Video Collections on Mobile Devices**", p. 423-427, *Proc. BCS HCI 2010* (Short Paper).

C7. Jochen Huber, Jürgen Steimle, Simon Olberding, Roman Lisserman, Max Mühlhäuser: "**An Interaction Concept for Browsing E-Lecture Libraries on Mobile Devices**", *Proc.IEEE International Conference on Advanced Learning Technologies (ICALT'2010)*, p. 151-155, IEEE Press, 2010 (Full Paper). [acceptance rate: 31 %]

C6. Mohammadreza Khalilbeigi, Dirk Bradler, Immanuel Schweizer, Florian Probst, Jürgen Steimle: "**Towards Computer Support of Paper Workflows in Emergency Management**", *Proc. 7th International Conference on Information Systems for Crisis Response and Management*, p. 1-9, 2010 (Full Paper)

C5. Jürgen Steimle: "**Designing Pen-and-Paper User Interfaces for Interactions with Documents**", *Proc. International Conference on Tangible and Embedded Interaction (TEI'09)*, p. 197-204, ACM Press, 2009. (Full Paper)

C4. Jürgen Steimle, Oliver Brdiczka, Max Mühlhäuser: "**CoScribe: Using Paper for Collaborative Annotations in Lectures**", *Proc. 8th IEEE International Conference on Advanced Learning Technologies (ICALT'08),* p. 306-310, IEEE Press, 2008. (Full Paper, **Outstanding Full Paper Award**) [acceptance rate: 30 %]

C3. Jürgen Steimle, Oliver Brdiczka, Max Mühlhäuser: "**Paper-Centric Structuring in Learning Processes**", *Proc. 8th IEEE International Conference on Advanced Learning Technologies (ICALT'08),* p. 685-687, IEEE Press, 2008. (Short Paper) [acceptance rate: 40 %]

C2. Jürgen Steimle, Oliver Brdiczka: "**Paper-Centric Interaction Concepts for Collaborative Learning**", *Conference Proceedings of Mensch und Computer 2008*, p. 207-216, 2008. (Full Paper)

C1. Jürgen Steimle, Iryna Gurevych, Max Mühlhäuser: "**Notetaking in University Courses and its Implications for eLearning Systems**", *Proceedings of DeLFI - 5. e-Learning Fachtagung Informatik*, p. 45-56, 2007. (Full Paper, **Best Paper Award**)

BOOKS

B3. Jürgen Steimle: ***Pen-and-Paper User Interfaces***, Springer: Heidelberg, 2012.

B2. Max Mühlhäuser, Werner Sesink, Andreas Kaminski, Jürgen Steimle (Eds.): ***Interdisciplinary Approaches to Technology-Enhanced Learning***, Waxmann: Münster/New York, 2011.

B1. Jürgen Steimle: ***Algorithmic Mechanism Design: Eine Einführung***, Springer, 2008.

JOURNAL ARTICLES AND BOOK CHAPTERS

J14. Jürgen Steimle: "**Printed Electronics for Human-Computer Interaction**", *ACM interactions*, 22(3), ACM Press, 2015 (to appear).

J13. Yoshihiro Kawahara, Steve Hodges, Nan-Wei Gong, Simon Olberding, Jürgen Steimle: "**Building Functional Pervasive Computing Prototypes using Conductive Inkjet Printing**", *IEEE Pervasive Computing*, 13 (3), p. 30-38, IEEE Press, 2014.

J12. Jürgen Steimle, Eva Hornecker, Albrecht Schmidt (Eds.): „**Interaction Beyond the Desktop**", *Special Issue of Informatik Spektrum*, 37(5), Springer, 2014.

J11. Jürgen Steimle, Simon Olberding: „**Verformbaren Mobilgeräten gehört die Zukunft: Wie gedruckte Elektronik und deformierbare Bildschirme die Interaktion mit mobilen Anwendungen verändern werden**“, *Informatik Spektrum*, 37(5), p. 402-406, Springer, 2014.

J10. Daniel Leithinger, Jürgen Steimle, Anthony Tang (Curators): **Demo Hour**, *ACM interactions*, May/June 2013, p. 8-9, ACM Press, 2013.

J9. Jürgen Steimle, Roman Lissermann, Simon Olberding, Mohammadreza Khalilbeigi, Wolfgang Kleine, Max Mühlhäuser: “**Be-greifbare Interaktionen mit größenveränderbaren Bildschirmen** [Tangible Interactions for Resizable Displays]”, *i-com*, 11 (2), p. 26-31, 2012.

J8. Jürgen Steimle**,** Christof van Nimwegen: “**Disruptive or Seamless? User Interfaces for Technology-Enhanced Learning**” in: M. Mühlhäuser et al. (Eds.) *Interdisciplinary Approaches to Technology-Enhanced Learning*, p. 313-324, Waxmann: Münster/New York, 2011.

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Third-Party Funded Projects

Jürgen Steimle

2015 **Intel** "Printed Thin-Film Displays for Wearables" (in preparation)

This project is currently in preparation to be funded by Intel's New Device Group. The New Device Group is Intel's most forward-looking division, which is focusing on new application areas for embedded microcontrollers. Intel contacted us actively to start this collaboration. They are interested in exploring the use of thin-film printed displays (our PrintScreen technology) in wearable devices that are powered by Intel's latest family of microcontrollers, the Intel Edison and Intel Curie platforms.

2013 **MIT MISTI Seed Funding** "Next Generation Interactive Surfaces" from Massachusetts Institute of Technology, Principal Investigator, 2013-2014, USD 30,000

This project provided seed travel funding for collaboration between my research group at the Max Planck Institute for Informatics and two research groups at Massachusetts Institute of Technology (groups of Prof. Pattie Maes and Prof. Joe Paradiso). The project followed my on-site appointment as a visiting assistant professor. In this project we investigated fabrication and interaction with a next generation of interactive surfaces that are very thin, deformable and multi-modal. This project resulted in several mutual research visits and 6 joint publications (PrintSense at UIST 2013, PrintSense at CHI 2014, jamSheets at TEI 2014, Conductive Inkjet Printing in IEEE Pervasive Comp. 2014, AugmentedForearm at AH 2014, CloudDrops at PerDis 2015).

2012 **Independent Research Group** "Embodied Interaction" within the DFG Cluster of Excellence "Multimodal Computing and Interaction", Independent Research Group Leader, 2012-2016, EUR 1.1 million

This grant provides funding of my independent research group at the Cluster of Excellence on Multimodal Computing and Interaction. The acceptance rate of proposals in my round (2011) was 5%. My research group focuses on next-generation interactive multimodal surfaces that are embodied within physical objects and on the human body. Currently the group consists of four PhD students and three Master's project students.

DFG Project "User Interfaces for Brainstorming Meetings with Blind and Sighted Persons", 2012-2014, Co-investigator, EUR 285,000

This grant funded an international project between TU Darmstadt (Telecooperation Lab), ETH Zürich (Innovation Center Virtual Reality) and Linz University (Institute Integriert Studieren). The project is funded by the Lead Agency scheme, in which DFG, SNF and FWF each fund the participating institution in their respective country. The goal of the project consisted of investigating assistive interfaces for meeting situations, which help blind people and sighted participants to effectively collaborate in the co-located setting. I prepared the proposal for TU Darmstadt together with Prof. Max Mühlhäuser, both of us acting as co-investigators.

NSERC Surfnet Special Project Proposal, 2012, CAD 12,500

This proposal provided student funding for a collaborative project with the University of Calgary and Nokia. The project investigated use of handheld projectors for spatial interactions.

Research Statement

Jürgen Steimle

My research is situated in the area of ubiquitous and mobile computing interfaces. The use of computing devices is dramatically changing: classical desktop computers are increasingly being replaced and complemented by mobile and embedded devices; these are continuously further miniaturized, embedded in a myriad of ways into the physical environment, into products, or even worn directly on the user's body. This opens up exciting new possibilities for computing, but also entails hard challenges, as existing desktop-style or touch-based interaction paradigms do not transfer to embedded settings. In embedded settings, physical form factors and material properties are fundamentally different from the planar, rectangular, and glass-like devices that are common today. To give only two examples, tiny devices make conventional touch interaction challenging, while curvature and deformability demand for new input/output technologies. This calls for new device form factors and corresponding new interaction modalities as well as for easy personalization and customization of interfaces. In addition, ubiquitous and mobile computing applications pose new demands on implicit, situated, multimodal and "calm" interactions.

Solving these challenges is the prerequisite for successful deployment of the next generations of UbiComp devices. In my research, I develop and study new interaction paradigms for situated, tangible and embodied interaction with smart objects and in smart environments; to enable these interactions, I develop new technologies for embedded sensing of multimodal input and embedded output; my concepts are deployed and studied in a variety of application domains, including knowledge work, digital fabrication, and mobile interaction.

I am focusing on investigating how new generations of multimodal interactive surfaces can improve ubiquitous and mobile computing. Key goals are 1) improved embedding of user interfaces within the physical context, including physical properties and material characteristics, 2) more expressive interaction modalities that go beyond the few degrees of freedom of touch input, 3) improved mobile and situated use, and lastly 4) easing design and fabrication of smart objects and embedded computing interfaces.

I firmly believe in the strength of on-site collaboration and have experienced this as a major contributing factor to successful research and teaching. At my previous workplaces I have intensely collaborated with other faculty members (e.g., at MIT Media Lab with Prof. Maes, Prof. Paradiso, Prof. Ishii and in Saarbrücken with Prof. Oulasvirta, Prof. Seidel and Prof. Krüger) and have contributed to establishing the research network Saarbrücken HCI. Other collaborators include James D. Hollan from UC San Diego, Carmel Majidi from CMU and Steve Hodges from MSR.

My results are published in the international top-tier conferences and journals (regularly at ACM CHI and ACM UIST) and have been distinguished with various awards (e.g., Best Computer Science Dissertation 2009 in Germany, Austria and Switzerland, Best Paper Awards at CHI and UIST, MIT Technology Review Top 80 Worldwide Innovator). My collaborators include Pattie Maes, Joe Paradiso and Hiroshi Ishii from MIT, James D. Hollan from UC San Diego, Carmel Majidi from CMU and Steve Hodges from MSR.

This document outlines my research methodology (p. 2), my prior research (p. 2) and my vision on future research (p. 6).

Research Methodology

My research is methodologically organized in three main pillars:

1. Development of new **technologies and algorithms** (both software and embedded systems) for interaction in ubiquitous and mobile computing. This comprises sensors and displays for realizing smart objects, interactive surfaces, and sensor-rich environments. Hereby I research both on printed electronics (thin-film sensors and displays) and on visual computing approaches (camera-based tracking, 3D reconstruction, 3D projection mapping).
2. User-centered design and systematic modelling of interaction paradigms for **ubiquitous and mobile media**. The goal is to **enable new uses and improve existing uses in a variety of application domains**, including knowledge work, digital fabrication, and mobile computing. This work is guided by models and theories of (situated) interaction, such as affordances, embodiment, multimodality, or proxemics, and aims at contributing to a systematic and theoretical understanding of principles of interaction in post-desktop scenarios.
3. Systematic **empirical analysis** with quantitative and qualitative methods. For one, I conduct informing studies with the goal of analyzing the socio-technical ecologies of use and the possibility space for novel technical approaches and interaction. Secondly, I conduct validating studies to evaluate technologies, interactions, and applications with users.

My research is characterized by a deep integration of these three pillars. This implies that my research is inherently bridging between novel technologies for sensing and output, novel interaction techniques and user-centered application design. My research starts from demands in real-world application contexts, which in many cases are identified in empirical studies [e.g., J1, C1, C10, C26]. These inform the development of new interaction technologies [e.g., C24, C27, C30, J13]. New technologies, along with empirical demands and theories, enable and inform new uses and new interaction paradigms, which in turn enable or improve real-world applications [e.g., J1, C5, C16, C18, C20, C21, C24, C27, C30]. Moreover, results on each level typically trigger new requirements that influence follow-up research. By addressing the research domain on all those levels and in an integrated manner, my goal is to ensure the research is systematic and rooted in real-world demands while benefitting from the enabling potential brought in by cutting-edge technologies.

To bring my research results to practice and to investigate their use in practice, I cooperate with external partners. For instance, I am collaborating with a maker space on digital fabrication of computing devices and with a big manufacturer of microprocessors on applications in wearable computing.

My research is highly multi-disciplinary. I approach the field from a Computer Science perspective, and contribute results at the intersection with materials science and printed electronics, cognitive science, educational science, design and fabrication. I have closely worked with educational scientists and psychologists within the multi-disciplinary DFG research training school (Graduiertenkolleg) “E-Learning”, with designers and artists at the MIT Media Lab, and with cognitive scientists at Saarland University.

Prior Research

Digital Fabrication of Flexible Interactive Surfaces with Embedded Sensors and Displays (since 2012)

Thus far, interaction in new mobile and ubiquitous settings was largely constraint by interaction hardware, which was available in only a few sizes and in a rectangular, planar, rigid and rather thick form factor. Printed electronics is opening up new avenues for inexpensive fabrication of electronic components, which are very thin, lightweight, and deformable. In my research I have developed pioneering techniques, which

allow for the first time to easily print custom interactive surfaces which are thin and deformable, using a vector graphics approach. With our techniques, laypeople can use Adobe Illustrator and an off-the-shelf inkjet printer (<100 Euros) to print multi-touch sensors and light-emitting thin-film displays on paper or foil in a direct, simple and inexpensive process. Both shapes and content can be individually designed, to be customized for a specific user or usage context. To ease the graphical design, we have contributed a set of display primitives, which are functional building blocks that abstract from the underlying technical details. Our process enables fabrication of electronic devices and interactive media that have substantially novel properties: not only are they significantly more mobile due to the thin and deformable form factor; they are also usable in novel interactive scenarios (e.g., in paper, packaging, wallpaper, furniture, wearable accessories or textiles), customized for an individual user and cheap enough for a truly ubiquitous deployment. This series of work was published at ACM CHI, ACM UIST and in IEEE Pervasive Magazine [C21, C24, C27, J13]. The work was distinguished with a Best Paper Award at ACM UIST 2014. [1]

1. Digital design 2. Print 3. Use

Wearable Interfaces (since 2013)

Today's wearable computing devices, such as smart watches or Google Glass have very restricted surface real estate for input and output, bringing touch interaction to its limit. In my research I have investigated use of human skin as an interactive surface. Using skin allows for further miniaturizing device hardware, while offering a large surface for input. Not only is skin always available in mobile scenarios; it also is an emotional and multimodal sensitive organ. This promises new forms of usage for wearable media that extend beyond classical multi-touch input.

In a first empirical study, published as a full paper at ACM CHI 2014 [C26], I investigated what gestures people want to use on skin for controlling mobile computing devices and for communicating with other people. Our results revealed that skin can be effectively used in a way similar to conventional multi-touch surfaces; in addition, skin allows for more expressive forms of input, which have great potential for supporting remote communication. Based on these findings, we have developed a skin-compatible touch sensor in collaboration with colleagues from Carnegie Mellon University in mechanical engineering and materials science. The touch sensor is very thin, more stretchable than skin and customizable in size, shape and visual appearance. We have furthermore developed new application concepts for on-skin interaction. This work has been published as a full paper at ACM CHI 2015 [C30] and received a Best Paper Award. It has been informed by findings from our

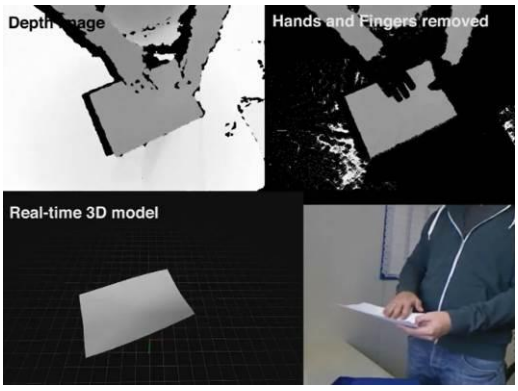
[1] For more information, I am referencing in brackets the list of publications. Moreover, you can find additional videos and images on http://embodied.mpi-inf.mpg.de.

prior explorative work on interactive surfaces on the forearm [C18] and on fingernails [W11].

User Interfaces for Mobile Devices with Flexible Displays (since 2010)

Deformable displays enable new types of mobile and handheld devices, which can be bent, folded or rolled. This adds to the mobility of these devices, but also enables substantially novel interaction modalities for graphical user interfaces. In a series of work, I have systematically investigated these modalities.

I started by investigating multimodal interaction concepts that leverage physical folding and rolling of the display for dynamically adapting the screen size to the specific content and usage context [C13, C15]. The combination of touch input and physical manipulation allows for intuitive and direct navigation in graphical content, amongst others in photo collections, text documents and maps. In addition to interactions for a single user, I have investigated use of rollout displays for mobile co-located collaboration [C16], enabling large collaborative surfaces in on-the-go settings. Furthermore, with *Flexpad* [C20], I have investigated interaction concepts that capitalize on high-resolution deformations of a flexible display as a new way for analyzing volumetric data. With an application in a medical context, I could demonstrate that multidimensional deformation of the display provides a very intuitive and direct way of exploring a volumetric dataset. This is particularly beneficial for laypeople, such as patients who want to look at their MRI scans or pupils who want to explore the inner workings of the human body.



We have technically realized these concepts by real-time 3D projection mapping. To this end, we have developed a new markerless tracking technique, which captures the deformed geometry of a flexible object in real-time [C20]. Our technique allows for transforming virtually any deformable surface into a deformable input device or a deformable display, without requiring any further instrumentation of the object. As an alternative, novel OLED displays will make it possible in the near future to realize our prototypes as fully mobile devices with embedded active displays.

This series of work was published at CHI 2011, 2012 and 2013, at TEI 2012, and has received a Best Paper Honorable Mention Award at CHI 2013.

Digital Paper for Learning and Knowledge Work (2006-2009)

Despite all technical progress, conventional paper keeps being a central medium for learning and knowledge work. A large body of empirical research has shown that paper-based processes are highly effective, amongst others because of the flexible navigation possibilities and the dynamic structuring of information. For these reasons the objective of my dissertation was to contribute new interaction techniques which bridge the gap between paper documents and digital information. Amongst the key contributions of the dissertation are an ecological model of collaborative work with paper and digital documents as well as an integrated set of novel interaction techniques, which combine approaches known from the World Wide

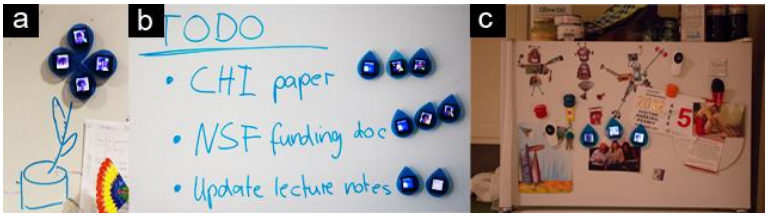
Web and Web 2.0 with physical annotation practice. These new concepts allow users to annotate documents collaboratively, to link them with hyperlinks and to tag them – no matter whether the documents are digital or printed on paper. Aiming for a high degree of integration in various ecologies of use, I have extended the Anoto digital pen technology to be usable not only on paper, but also on tabletop screens right within the Web browser. The results of two empirical evaluation studies demonstrated that the concept significantly increases the efficiency of physical/digital knowledge integration tasks and user satisfaction. The work was published in IEEE Transactions on Learning Technologies [J1], as a Springer monograph [B3] and has received several awards, including the GI Best Computer Science Dissertation Award.

Interaction Concepts for Interactive Tabletop Displays (2010-2013)

Existing interaction concepts for tabletop displays are typically based on the assumption that the table is only used as a screen, maybe in combination with dedicated objects for tangible input. I postulate that a more realistic setting accounts for use as both a conventional table (e.g., a desk) and a screen. This requires understanding how digital media and physical objects can be concurrently used on the same surface; it also demands for interaction concepts that support such concurrent use. In collaboration with James D. Hollan from UCSD, I have conducted a detailed empirical analysis to investigate how paper documents are used together with digital media on tabletop displays [C10]. Based on these findings, we have developed new hybrid interaction concepts, which seamlessly integrate physical objects on tabletop displays with digital content [C22, P4]. These make it possible to effectively work with digital media on a tabletop despite the occlusions generated by conventional objects. In follow-up work [C25] I have investigated interaction techniques that enable co-located collaboration on a tabletop display, which is technically able of creating individual, separate views for each user. This series of work was published as full papers at ACM CHI 2015, ACM ITS 2010 and ACM ITS 2012.

Spatial and Situated Displays (since 2010)

Accounting for the outstanding role of space for cognitive processes, I have investigated interaction concepts and applications for displays that make use of spatial location. In two follow-up projects, each of them published as a full paper at ACM Multimedia [C11, C17], I have developed spatial navigation techniques for video collections. While the first work capitalizes on spatial visualizations and gestures on a smartphone, the second work leverages paper-like displays. By arranging them intuitively in physical space, similarly to how we interact with paper documents, the user can navigate through the video collection and organize it. Hence spatial practices, which have proven highly effective for printed documents, can now also be used for time-continuous videos.



More recent work on CloudDrops [C28] allows people to make use of the entire physical space for laying out digital information, such as reminders, awareness information about other people, or information about documents. It is a physical awareness platform that allows for lightweight augmentation of the user's surroundings with digital information. A CloudDrop is a tiny device featuring a small display, which can be

associated with a dynamic piece of information in the cloud. A single or multiple CloudDrops can be attached at a meaningful location in the environment to provide awareness of documents, events, tasks and persons and to support lightweight remote communication. Hence, digital information seamlessly integrates into existing physical space and physical practice, creating a very intuitive interface for digital information.

Future Research

My research focus on new sensing and output technologies for Ubiquitous Computing and corresponding paradigms for interaction with new media seems to perfectly complement the existing focus areas at the University of Siegen. It provides a bridge between the strong existing activities at the University of Siegen on sensors & visual computing and on new media. The combination of research topics would generate strong synergies for joint research and teaching and would be a compelling starting point for shaping together the future of Ubiquitous Computing. As outlined below, I see many opportunities for collaboration within the departments of ET/IT and business informatics, at ZESS, with media studies as well as with industry.

If appointed at the University of Siegen, my goal is to strive for highest excellence in research and to contribute to further strengthening the profile of both Faculty III and IV. Building on my previous achievements, my goal is to position my group within the leading international groups. I aim for our group to have a continued stable presence on the top conferences in our domain. Together with the other groups, I want to contribute to a highly visible and leading center for Ubiquitous Computing at the University of Siegen. Together it will be possible to cover all levels of Ubiquitous Computing, ranging from UbiComp technologies (sensing, visual computing, embedded and distributed systems) via interaction techniques up to the user-centered systematic investigation of applications that are enabled by new UbiComp media in a variety of real-world domains.

For my future research, I plan to investigate the following four main topics. Each topic is addressing an essential and complementary pillar of what I consider to be main challenges of interaction in Ubiquitous Computing, as outlined in the beginning of this document. Each topic is cutting across the dimensions of sensing technology, interaction techniques, and real-world applications of new media. My planned research builds on my prior work on printed sensors, flexible surfaces, and corresponding multimodal interactions – areas in which my group is internationally recognized and which define an important research space, which is still largely underexplored.

1) **Embeddded interactive surfaces and displays**: Research on future (curved, flexible and multimodal) interactive surfaces that have new properties for improved embedding in physical contexts, for more expressive interaction and for improved collaboration in a variety of application domains.

2) **Digital fabrication and personalized production**: Development of solutions enabling to 3D print customized products and UbiComp devices that fit the user and their context of use. The aim is to empower each end-user to be able to fabricate a personalized product or device quickly and easily, comparably to how documents or photos can be printed today.

3) **Wearable computing**: Development of sensors, devices and interaction concepts to enable better use of body-worn interactive devices and to support applications in the area of mobile computing, social computing and assistive technologies.

4) **Theoretical modeling of post-desktop interaction**: Systematic study of performance and ergonomics of post-desktop user interfaces through embedded sensors, optical motion capture and biomechanical simulation.

1. Interactive surfaces for embedded interfaces: 3D shaped, deformable and multimodal

Effective embedding of interactive surfaces on smart objects or in smart environments requires going beyond the fixed-size, planar and rectangular form factor of today's displays and touch surfaces –to give just a few examples, think of the geometry of many everyday objects, furniture, clothing, or the interior of cars.

Building on my prior research on computationally augmented materials [C21, C24, C27, C30, C15, C20], I plan to develop technologies for sensor and display surfaces that can be embedded into virtually any surface, preserving the geometric, visual and haptic properties of the material. These will be based on printed electronics and visual computing approaches and shall be able to sense multi-modal input.

Such new interactive surfaces will enable a much wider set of interactions than conventional glass-like interactive surfaces; I envision them to resemble skin in their sensing capabilities rather than existing touch-only surfaces. My goal is to develop and study input gestures and graphical user interface widgets that leverage the properties of 3D shaped and deformable displays and the material characteristics in embedded contexts. This shall lead to a richer vocabulary of gestures and widgets that might be better suited for interaction with many types of embedded interfaces. In addition to embedded contexts, I see high potential for improving interactions on small displays: touch-only interaction is currently reaching its limits on the increasingly small mobile devices; multi-modal interactions can better leverage the limited input space on such devices.

Capitalizing on these new possibilities for interaction, I plan to investigate applications in mobile computing, situated interaction, and assistive technologies. This includes user-centered development and study of novel interactive surfaces that support collaboration in mobile scenarios. By providing a large display and input surface on demand, the flexible and curved form factor enables to create a collaborative space in settings where thus far users had to resort to small displays. Examples include co-located collaboration in the car, on-the-go meetings, planning work on construction sites, and coordination of first responders on emergency sites. This work will be based on my prior research on resizable and curved displays [C13, C15, C20]. Furthermore, I am also highly interested in investigating thin and deformable multimodal sensor surfaces for assistive technologies, based on technical principles from my prior work [C24, C27, C30]. For instance, flexible multimodal sensors could allow for continuously monitoring the location and physical state of elderly people by means of sensor floors, or for monitoring breathing activity or humidity by means of a flexible sensor on the mattress, just to give two rather obvious examples.

These research questions are offering many points for connection within the department of EE/IT, the ZESS and the research training group Imaging New Modalities. These revolve around optical capturing of input, 3D reconstruction, printed thin-film sensors and innovative functional materials. Many further opportunities for collaboration exist within the department of Business Informatics. These include the user-centered design of mobile interactive surfaces for co-located collaboration and the study of real-world applications in various fields, including emergency management and elderly care.

2. Digital fabrication and personalized production (Industry 4.0)

Digital fabrication is a field of application which has very high relevance for computer science: after the advance of computing in *digital media*, which have made media use and media production both ubiquitous and affordable for laypeople, computing is now extending into the *production of physical objects*. Experts of the field see a large potential in digital fabrication for the next industrial revolution, allowing the automated production of highly personalized and customized products in Industry 4.0 facilities. The young topic

requires innovative research at the intersection between human-computer interaction, computer graphics, embedded systems, materials science, and social sciences. Within this overall question, I plan to investigate two essential questions, building on my prior work on digital fabrication [C21, C24, C27, C30, J13 and J14]:

Firstly, how can end-users easily and quickly customize objects for personalized production? As it cannot be assumed that laypeople design their objects in a CAD environment, I propose a different approach, which is interaction- and data-driven. It is based on capturing an end-user's natural interaction with a product, using embedded sensors and by optical capture with an external camera. This captured data is used to parameterize an existing model, such that the object is personalized for this specific user. For instance, in a shoe store, a user is trying on a pair of shoes which is equipped with embedded sensors to capture information about the geometry of the user's feet and the user's gait. The captured data is used to digitally fabricate a personalized pair of shoes which is delivered to the user within just one or two days. In addition to such implicit interaction, I plan to design and study input gestures; these shall allow the user to modify an existing product in a more direct and explicit way. This vision requires a number of challenging research questions to be solved: for one, this regards novel technical solutions for capture of interaction data, through imaging approaches and embedded sensors; second, we require approaches for the automatic parameterization of a product's model based on interaction data; furthermore, it is unclear what are appropriate input gestures to be performed right on the product; lastly, it is important to investigate on a broader level what products users might want to personalize and what are the dimensions that need to be personalized.

The second main question I plan to investigate revolves around 3D printed interactive objects. So far, 3D printing allows for fabricating three-dimensional geometries, which however largely remain passive. My goal is to develop principles and technical approaches to 3D printing of interactive objects, which react on touch and other input modalities and provide visual and haptic output. This will empower end-users to produce custom and personalized interactive devices. For example, personalized Ubiquitous Computing devices can be customized to the specific physical use context in the user's home. Wearable and mobile devices can be personalized in size and aesthetics for an individual user. Or individual data can be physically visualized in a custom-generated interactive visualization. This vision implies developing new hardware sensors, displays and actuators, which can be realized with 3D printing and directly embedded into the object in one single printing pass. My goal is to develop high-resolution multi-touch sensors, pressure sensors and deformation sensor, as well as embedded light-emitting displays and shape-changing actuators that can be 3D printed.

This topic lends itself to collaboration within business informatics on various questions, including end-user development and design, appropriation of digital fabrication technologies, physical media, and logistics. In ET/IT, I see many opportunities for collaboration on camera-based sensing of product interactions, embedded printable sensors, as well as object recognition, 3D reconstruction and modeling. In media studies, I see potential for collaboration on new types of located media that are embedded within products. The topic is also one core question of the University-wide "Forschungskolleg Zukunft menschlich gestalten". Outside the university, I see a high potential for collaboration on advanced manufacturing with regional small and medium-sized enterprises in engineering, fabrication and printing. For those companies, leadership in digital fabrication seems to be a competitive advantage, if not a must-have, to succeed on a globalized market.

3. On-body interaction

With the aim of improving interaction with wearable computing devices, I plan to systematically investigate the input and output space on the human body. This will extend our findings from a first empirical study on multi-modal body input [C26] to an improved understanding of the influence of body location on input possibilities and output possibilities. Grounded on these findings, I plan to develop new multimodal

sensors and displays for on-body input and output. Here I can build on my prior work on soft matter sensors and flexible displays [C27, C24, C30], connecting to Siegen's research on innovative materials and printed sensors. As a complementary input modality, I plan to capitalize on miniature depth and RGB sensors that are deployed at unconventional locations on the human body and observe the input space from unconventional perspectives. For instance, depth sensors may be integrated into a ring to capture not only on-skin touch input and hand gestures, but also the interaction the hand is performing with physical objects. This creates challenging questions on depth sensing and accuracy, real-time image stabilization, multi-view tracking and object tracking. These lend themselves to collaborations with the ZESS, the visual computing groups and PMD Technologies.

With these novel sensor solutions, my goal is to leverage the expressive power of on-body interaction for more versatile, intuitive and expressive interaction with mobile computing devices. This includes new means for remote interpersonal interaction. Together with results from research on digital fabrication of interactive objects, this shall enable a new class of personalized, aesthetic and multimodal body-worn interfaces. On the other hand, I see great potential in new body-worn sensors for health and behavior monitoring in assistive contexts, e.g., for the elderly and for people with specific needs. Likewise, new forms of subtle visual or haptic output on the body, realized with my technologies, could contribute to medical or persuasive interfaces. The strong focus on social computing and assistive interfaces at the University of Siegen is offering an exciting environment for engaging in collaborations on this topic.

4. Systematic analysis of post-desktop interaction

While the efficiency and ergonomics of interaction with desktop computers (keyboard, mouse, monitor) is quite well understood, those factors are still largely unexplored for modern post-desktop interaction styles. Knowing about those factors would allow for designing better user interfaces for Ubiquitous Computing. Based on my ongoing collaboration with Antti Oulasvirtta (previously at Max Planck Institute, now at Aalto University), I plan to use embedded sensors, optical motion capture and biomechanical simulation for developing empirical models on interaction with various mobile and ubiquitous user interfaces. We have already studied touch input on various types of touch devices [R1]; my plan is to study efficiency and ergonomics of touch input on human skin as well as touch input on curved and elastic surfaces, such as on smart objects, on furniture or in the car. By doing this, I aim at contributing to the conceptual and theoretical understanding of post-desktop interaction. An open challenge is to develop new mobile tracking solutions, to capture interaction in mobile and natural settings outside a formal laboratory experiment. Here, a collaboration on mobile tracking solutions seems very promising.

Teaching Statement

Jürgen Steimle

In teaching, I have been offering numerous courses in the Bachelor and Master programs in Computer Science and Media Informatics at TU Darmstadt, the MIT Media Lab and Saarland University. In addition to regularly teaching the HCI introductory lecture at Saarland University, I was responsible for the creation of several courses, including an introductory lecture to HCI at TU Darmstadt and a seminar on interactive embedded systems at Saarland University in cooperation with our local maker space. My courses are well received and greatly appreciated by the students. For instance, the two mentioned courses both ranked very high in student evaluations. My university-level secondary teaching certificate provided me with didactic skills that I leverage for my teaching. Last but not least, before starting my PhD already, I have authored a university textbook on Algorithmic Mechanism Design, which is published by Springer.

Prior Teaching

Lectures

I have created the new introductory lecture on **Human-Computer Interaction** at TU Darmstadt, as this topic has not been part of the curriculum before. The lecture covers foundations from psychology and cognitive science, interaction models, user-centered design methods, experience design, interaction technologies, history of user interfaces, multimodal and multimedia interactive systems, empirical data gathering methods and empirical evaluation methods. The lecture was offered first in 2010/11 and had more than 100 regular participants. It has been very positively evaluated by students, amongst the top 5 of all 40+ lectures at the department of Computer Science. The lecture was complemented by a practical lab course, in which participants could apply and deepen the knowledge in a group project. Since I left TU Darmstadt, the lecture is continuously being taught by my former PhD students, now Post-Docs, Jochen Huber and Mohammadreza Khalilbeigi.

At Saarland University, I have been teaching the lecture **User Interface Design** several times together with Prof. Antonio Krüger. This is the introductory lecture on Human-Computer Interaction for the Computer Science and Media Informatics curricula. My lectures and the complementing assignments teach the user-centered design process, user-centered requirements analysis, techniques for creative and innovative design of user interfaces, methods for digital and physical prototyping as well as empirical methods for data gathering and evaluation.

At the MIT Media Lab, I was a guest lecturer in the lecture **New Paradigms in Human Computer Interaction**, which was offered by Prof. Pattie Maes and Prof. Hiroshi Ishii. My classes focused on flexible and shape-changing displays (technology, affordances, design approaches, user interface concepts, products).

Seminars and Practical Courses

As part of the curricula on Computer Science and Media Informatics of Saarland University, I am also regularly teaching seminars and practical courses. These allow students to work in more depth on selected topics from the introductory lecture.

I have recently created a seminar with complementing practical group projects on **Developing Embedded Interactive Systems with the Arduino Microcontroller**. The seminar was a collaboration with HackSaar e.V., Saarbrücken's local maker space, and took place in the maker space. Thereby the seminar was pursu-

ing a two-fold objective: First, students learn in project groups how to develop and implement cyber-physical computing systems with a microcontroller and simple hardware (sensors, displays). Second, we actively networked our students and the CS department with technology-interested and creative people outside the university. The transfer of knowledge and skills turned out to be fruitful for both sides: while members of the maker space got familiar with latest technologies from research (conductive inkjet printing), our students largely benefited from the large creativity and innovative strength of the maker movement. In the student evaluation, this course was evaluated top 4 of all 43 courses of the computer science department at Saarland University.

In a seminar on **Embodied Interaction**, students learned about the theoretical and conceptual foundations of embodied, embedded and ubiquitous media. In a practical group project they have then developed several new embodied interfaces. A methodological focus was laid on practically applying the user-centered design method.

At TU Darmstadt, I have offered **four project classes** (Projektpraktika), in German and in English language. Topics of these courses were: 1) **Multi-touch Interaction for 3D environments**, 2) **Interactive tabletops**, 3) **Paper-centric user interfaces** and 4) **Embodied Media.** In each course, several groups of students have intensively worked under my guidance on a practical project during an entire semester. I highly appreciate this form of teaching, as it allows me to individually address the specific prior knowledge of the groups and to teach skills in a targeted way. Lastly, I have taught two further seminars as a co-instructor. This includes a seminar on **E-Learning** (including learning with Web 2.0 platforms, annotation systems) and a seminar on **Creativity and Ideation**.

Supervision of Students

I am currently supervising four dissertation projects (one of them in co-supervision with Antti Oulasvirtta). My first generation of PhD students at TU Darmstadt have already completed their dissertations. Two of them have defended with distinction and are now Post-Docs at MIT/SUTD and at TU Darmstadt. Moreover, I have supervised 10 Bachelor theses, 11 Master and diploma theses and 3 study theses.

Future Teaching

At the University of Siegen, my plan is to represent the area of Ubiquitous Computing in teaching, with its technical, interaction-related and application areas. Furthermore I aim to contribute to teaching in the various curricula at the departments of Computer Science and Business Informatics. This includes both teaching introductory courses and advanced courses. I can teach all courses in German or in English.

Fundamentals of Computer Science

My background in Computer Science allows me to teach the introductory courses in the Computer Science and Business Informatics bachelor curricula, including Algorithmen und Datenstrukturen, Einführung in die Informatik II and Programmierpraktikum. In addition I can offer to teach advanced classes, for instance on software engineering or information systems.

Fundamentals of Ubiquitous Computing and Media Computing

My teaching activities will focus on ubiquitous computing, media computing and interactive systems. Contributing to the Bachelor and Master curricula in Computer Science and Business Informatics as well as to

the Master curriculum in HCI, I intend to teach the following courses, alone or in cooperation with other faculty:

The **Lecture Ubiquitous Computing** will provide an introduction to Ubiquitous Computing, including concepts, principles and models in technologies, interaction paradigms, and their applications. Topics include sensors, context, location-based services, activity recognition, mobile communication, paradigms for mobile and ubiquitous interaction, adaptive and intelligent systems, smart environments, security and privacy. The class shall provide a bridging function: for students of Human-Computer Interaction and Business Informatics, it provides a somewhat more technology-oriented perspective, to deepen their technical knowledge of ubiquitous computing; for students of ET/IT, it offers a complementing media-oriented perspective on embedded computing systems by addressing questions of HCI for UbiComp, applications and societal implications. The lecture will be complemented by practical assignments. It shall be offered for first-year Master's students and, if possible, opened for interested third-year Bachelor students.

In addition, I can offer to teach or contribute to the courses on **Human Computer Interaction, User Experience Design**, and **Usability and empirical design methods.** I have frequently taught introductory lectures on Human Computer Interaction and on User Interface Design and have myself created such a lecture at TU Darmstadt. Topics to be taught include human factors and cognitive factors, interaction models, user-centered design process, design paradigms, main paradigms of user interfaces, post-desktop interface classes (mobile, multimodal, wearable, immersive, AR interfaces), interactive technologies and empirical evaluation methods.

Advanced Courses

For advanced studies, I plan to offer specialized lectures and seminars on changing topics of ubiquitous computing, mobile, tangible and ubiquitous interfaces, and digital fabrication. These topics shall be defined in close cooperation with other faculty members and instructors at the departments ET/IT and business informatics, to best complement existing courses. In the following, I will outline several exemplary topics:

The course **Mobile, Embodied and Situated Interfaces** is deepening knowledge on modern post-desktop user interfaces. The course will cover theoretical principles, essential interaction paradigms, technical approaches to input sensing, context detection and system output, application areas, and current research trends.

The course **Smart Spaces and Sensor-rich Environments** is focusing on technologies and applications of computationally augmented environments, such as so-called smart homes, smart meeting spaces, or smart public spaces. The course will cover various types of sensors, approaches to modeling context and detecting activity, (explicit and implicit) interaction paradigms for interactive spaces, and applications in home control, workplace collaboration, transportation and assistive interfaces.

The course **Interactive Surfaces and Displays** focuses on current trends in interactive surfaces. The course will briefly cover technologies for sensing of touch, pen-input, tangibles, and further input modalities such as presence of people, deformation and humidity. The main focus will be put on interaction paradigms and interaction techniques (for multi-touch, tangible interaction, and detection of implicit interactions) in a wide variety of applications of interactive surfaces ("classical" multi-touch displays, interactive walls, interactive furniture, interactive floors, interactive surfaces of smart objects, digital paper).

The course **Printed Electronics for Ubiquitous Computing** will familiarize students with backgrounds in Computer Science, Business Informatics and HCI with recent achievements in printed sensors, displays, and actuators. Knowledge in these domains will empower students to realize new (extremely thin, deform-

able, even stretchable) embedded ubicomp devices that seamlessly fit within their physical application context.

The course **Digital Fabrication Lab** revolves around principles of digital fabrication, technical platforms (3D printing, laser cutting, conductive inkjet printing), approaches and environments to 3D modeling, and application possibilities. My goal is to teach this class in cooperation with a local maker space in Siegen, as I have done in Saarbrücken.

In addition to conceptual and technical competencies, innovation is taking on a major role in the realization of technical systems. The **Innovation Seminar Ubiquitous Computing** will be focusing on the creative process of developing ubicomp systems. The course will cover creative methods, techniques for idea generation, and methods for innovative prototyping. This course shall provide detailed insights into two institutions which are renowned for their innovations: the MIT Media Lab and IDEO. The participants practically apply these methodological concepts in a group project in which they develop a new ubicomp system. I plan to teach this block course together with an instructor from the MIT Media Lab (where I have been previously).

Technische Universität Darmstadt

URKUNDE

Während der Amtszeit des Präsidenten Prof. Dr. Hans Jürgen Prömel
und des Dekans Prof. Dr. rer. nat. Karsten Weihe
verleiht der Fachbereich Informatik durch diese Urkunde

Herrn Jürgen Steimle

geboren am 11. März 1980 in Mutlangen

den akademischen Grad eines Doctor rerum naturalium (Dr. rer. nat.)

nachdem er in ordnungsgemäßem Promotionsverfahren unter Mitwirkung
der Referenten Prof. Dr. rer. nat. Max Mühlhäuser, Prof. Dr. phil. Werner Sesink
und Prof. Dr. rer. nat. Jan Borchers durch seine Dissertation
Integrating Printed and Digital Documents:
Interaction Models and Techniques for Collaborative Knowledge Work
und durch die mündliche Prüfung seine wissenschaftliche Befähigung erwiesen hat.
Das Gesamturteil lautet: »mit Auszeichnung bestanden«

Darmstadt, den 23. Juni 2009

Der Präsident

Prof. Dr. Hans Jürgen Prömel

Der Dekan

Prof. Dr. rer. nat. Karsten Weihe

LANDESLEHRERPRÜFUNGSAMT
BEIM MINISTERIUM FÜR KULTUS, JUGEND UND SPORT
BADEN-WÜRTTEMBERG

ZEUGNIS

über die

WISSENSCHAFTLICHE STAATSPRÜFUNG FÜR DAS LEHRAMT AN GYMNASIEN

Herr **Jürgen Steimle**

geboren am 11. März 1980 in Mutlangen

hat vor dem Landeslehrerprüfungsamt beim Ministerium für Kultus, Jugend und Sport Baden-Württemberg - Außenstelle beim Regierungspräsidium Freiburg - die Wissenschaftliche Staatsprüfung für das Lehramt an Gymnasien nach der Verordnung des Ministeriums für Kultus, Jugend und Sport vom 13. März 2001 (GBl. S. 201) in der Fassung vom 12. Juli 2005 (GBl. S. 605) mit der Gesamtnote

mit Auszeichnung bestanden (1,2)

abgelegt.

Seine **wissenschaftliche Arbeit** im Fach Informatik über
Computational Mechanism Design
für robuste verteilte Algorithmen und Protokolle
wurde mit der Note **sehr gut bis gut** bewertet.

Er hat die Prüfung in den Prüfungsfächern

Französisch	(Hauptfach) mit der Endnote	**sehr gut bis gut** (1,40)
Informatik	(Hauptfach) mit der Endnote	**sehr gut** (1,00)

bestanden.

Aus den studienbegleitenden Nachweisen ergab sich
in den **Pädagogischen Studien**
die Endnote **sehr gut** (1,00),
im **Ethisch-Philosophischen Grundlagenstudium**
die Endnote **sehr gut** (1,00).

Herr Jürgen Steimle hat in den Hauptfächern die wissenschaftliche Befähigung für den Unterricht auf allen Stufen des Gymnasiums nachgewiesen.

Freiburg, den 31. Mai 2006

(Siegel)

MINISTERIUM FÜR KULTUS, JUGEND UND SPORT
LANDESLEHRERPRÜFUNGSAMT
BADEN-WÜRTTEMBERG

Stein
(Stein)

Schule Theodor-Heuss-Gymnasium Aalen

Baden-Württemberg

Zeugnis

der allgemeinen Hochschulreife

Vor- und Zuname Jürgen Steimle

geboren am 11.03.80

in Mutlangen

wohnhaft in 73433 Aalen, Weitbrechtstr. 30

hat die Oberstufe des Gymnasiums besucht, die Abiturprüfung bestanden und damit die Befähigung zum Studium an einer Hochschule in der Bundesrepublik Deutschland erworben.

Dem Zeugnis liegen folgende Vereinbarungen und Verordnungen zugrunde:

1. Die „Vereinbarung zur Neugestaltung der gymnasialen Oberstufe in der Sekundarstufe II" (Beschluß der Kultusministerkonferenz vom 7. Juli 1972 in der jeweils gültigen Fassung)
2. Die „Vereinbarung über die Abiturprüfung der neugestalteten gymnasialen Oberstufe in der Sekundarstufe II" (Beschluß der Kultusministerkonferenz vom 13. Dezember 1973 in der jeweils gültigen Fassung)
3. Die Beschlüsse zur „Einheitlichen Durchführung der Vereinbarung zur Neugestaltung der gymnasialen Oberstufe" (Beschluß der Kultusministerkonferenz vom 2. Juni 1977 in der jeweils gültigen Fassung)
4. Die Verordnung des Kultusministeriums über die Jahrgangsstufen 12 und 13 sowie über die Abiturprüfung an Gymnasien der Normalform und Gymnasien in Aufbauform mit Heim (NGVO) vom 20. April 1983 (K. u. U. S. 367) in der jeweils gültigen Fassung

ZEUGNIS DER ALLGEMEINEN HOCHSCHULREIFE

Vor- und Zuname, Geburtsdatum, Geburtsort sowie Name der Schule

Jürgen Steimle
geb. am 11.03.80 in Mutlangen
Theodor-Heuss-Gymnasium Aalen

I. Leistungen in den Jahrgangsstufen 12 und 13 (Qualifikationsphase) [1]

Fach	Punktzahlen in einfacher Wertung				Note [2]
	Jahrgangsstufe 12		Jahrgangsstufe 13		
	1. Halbjahr	2. Halbjahr	1. Halbjahr	2. Halbjahr	
Sprachlich - literarisch - künstlerisches Aufgabenfeld					
Deutsch	12	11	13	12	gut
Englisch	--	--	--	--	-----
Französisch (LF)	15	15	15	15	sehr gut
Latein	13	13	--	--	sehr gut
Griechisch	--	--	--	--	-----
Russisch	--	--	--	--	-----
-----	--	--	--	--	-----
-----	--	--	--	--	-----
Bildende Kunst	--	--	--	--	-----
Musik	15	15	--	--	sehr gut
Gesellschaftswissenschaftliches Aufgabenfeld					
Geschichte / Erdkunde / Gemeinschaftskunde [3]	13	13	13	[12]	sehr gut
Geschichte	--	--	--	--	-----
Erdkunde	--	--	--	--	-----
Gemeinschaftskunde	--	--	--	--	-----
Religionslehre	--	--	--	--	-----
Ethik	13	12	[12]	[12]	gut
Mathematisch - naturwissenschaftlich - technisches Aufgabenfeld					
Mathematik	15	14	13	[14]	sehr gut
Physik (LF)	15	14	15	15	sehr gut
Chemie	--	--	--	--	-----
Biologie	--	--	--	--	-----
Sport	[10]	[10]	[10]	[09]	gut
Wahlbereich					
Astronomie	--	--	--	--	-----
Darstellende Geometrie	15	14	--	--	sehr gut
Geologie	--	--	--	--	-----
Informatik	15	15	--	--	sehr gut
Literatur	--	--	--	--	-----
Computer-Alg	--	--	15	15	sehr gut
-----	--	--	--	--	-----
-----	--	--	--	--	-----
-----	--	--	--	--	-----

II. Leistungen in der Abiturprüfung

Prüfungsfach	Punktzahlen in einfacher Wertung		Note
	schriftl.	mündl.	
Leistungskurse (LF)			
1. Französisch	15	--	sehr gut
2. Physik	15	--	sehr gut
Grundkurse			
3. Mathematik	15	--	sehr gut
4. Geschichte	X	15	sehr gut

III. Gesamtqualifikation und Durchschnittsnote

Punktsumme aus 22 Grundkursen in einfacher Wertung	299	mindestens 110, höchstens 330 Punkte
Punktsumme aus 6 Leistungskursen (Halbjahr 12/1 bis 13/1 in doppelter Wertung) **und 2 Leistungskursen** (Halbjahr 13/2 in einfacher Wertung - Ausgleichsregelung -)	208	zusammen mindestens 70, höchstens 210 Punkte
Punktsumme aus den Prüfungsfächern (bei schriftlicher oder mündlicher Prüfung in einem Fach vierfache Wertung, bei schriftlicher und mündlicher Prüfung Punktzahl nach Anlage 1 zu § 15 Abs. 3 Satz 2 Nr. 2 NGVO) **einschl. der Ergebnisse im Halbjahr 13/2**	296	mindestens 100, höchstens 300 Punkte
Gesamtpunktzahl	803	mindestens 280, höchstens 840 Punkte

	in Ziffern	in Buchstaben
Durchschnittsnote gemäß Staatsvertrag	1.0	eins.null

IV. Ergebnisse der Pflichtfächer, die in Klasse 11 abgeschlossen wurden:

Fach	Note
Englisch	gut
Chemie	sehr gut
Biologie	gut
---	---
---	---
---	---
---	---

V. Sprachenfolge:

ab Klasse 5: Englisch

ab Klasse 7: Latein

ab Klasse 9: Französisch

Dieses Zeugnis schließt das XXXXX / Große Latinum / XXXXX ein.

Anmerkungen:

1) Die Bewertung von Grundkursen, die nicht in die Grundkursabrechnung eingehen, ist in Klammern gesetzt. Leistungsfächer sind mit (LF) gekennzeichnet.

2) Bei der Berechnung der Note sind alle Kurse einbezogen. Für die Umsetzung der Noten in Punkte gilt:

Noten	sehr gut	gut	befriedigend	ausreichend	mangelhaft	ungenügend
Punkte	15, 14, 13	12, 11, 10	9, 8, 7	6, 5, 4	3, 2, 1	0

3) In der jeweils vorgeschriebenen Kombination.

Ort, Datum: Aalen, den 22.6.1999

(Dienstsiegel der Schule)

THEODOR-HEUSS-GYMNASIUM · AALEN

Vorsitzende/r des Prüfungsausschusses: OStD Habmann

Schulleiter/in: OStD Heuwinkel

ERNST + KUCH

GESELLSCHAFT FÜR INFORMATIK E.V.

GI-DISSERTATIONSPREIS

Die Gesellschaft für Informatik e.V. (GI), das German Chapter of the ACM (GChACM), die Oesterreichische Computergesellschaft (OCG) sowie die Schweizer Informatikgesellschaft (SI) verleihen

Dr. rer. nat. Jürgen Steimle

für seine hervorragende Dissertation zum Thema
»INTEGRATING PRINTED AND DIGITAL DOCUMENTS: INTERACTION MODELS AND TECHNIQUES FOR COLLABORATIVE KNOWLEDGE WORK«
den Dissertationspreis 2009.

Die Entwicklung von Interaktionsmodellen für das kooperative Arbeiten ist ein klassisches Anwendungsfeld der Informatik mit einem hohen Grad an Interdisziplinarität. Computergestützte elektronische Stifte und andere innovative Verfahren eröffnen neuartige Möglichkeiten zur Dokument-zentrierten Gruppenarbeit mit elektronischen und Papier-Dokumenten, die es zu erschließen gilt.

Indem er ein systematisches holistisches Grundverständnis des Anwendungsfeldes entwickelt, schafft Herr Steimle die Voraussetzung für ein neues und grundlegendes Modell der Arbeit mit Papier und Stift. Darauf basierend erarbeitet er systematisch neue Interaktionstechniken für elektronische Stifte und Papier, die er in ein Gesamtkonzept integriert und systematisch evaluiert. Herr Steimle betrat Neuland und hat es durch Erkenntnisse, Theorie, Realisierung von Werkzeugen sowie deren Evaluation gestaltet.

Mit seiner Dissertation liefert Herr Steimle ein integriertes Gesamtkonzept einer hybriden physisch-elektronischen kollaborativen Dokumentbearbeitungsumgebung, das systematisch evaluiert und von großer praktischer Relevanz ist.

Mit dieser Preisverleihung würdigen die beteiligten Gesellschaften – die Gesellschaft für Informatik e.V. (GI), die Schweizer Informatik Gesellschaft (SI), die Oesterreichische Computergesellschaft (OCG) und das German Chapter of the ACM (GChACM) – eine herausragende wissenschaftliche Arbeit, in der ein mutiger und origineller Ansatz zu neuen Innovationen sowohl in der Informatik selbst wie auch im Umgang der Menschen mit Technologie führt.

Leipzig, im September 2010

Prof. Dr. Stefan Jähnichen
Präsident der Gesellschaft für Informatik e.V. (GI)

acm German Chapter

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Jürgen Steimle

wurde im September 2002 in die Studienstiftung aufgenommen.

Bonn, im Dezember 2002

Prof. Dr. Helmut Altner
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