Miroslav Bachinski

Curriculum Vitae

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I am a Human-Computer Interaction researcher at the University of Bayreuth. My research focuses on the development and application of data-driven methods to improve the ergonomics and performance of novel interaction techniques. I adopt optical motion capture, biomechanical modeling and simulation, and movement dynamics modeling besides standard performance measurement methods to evaluate the post-desktop user interfaces and build mathematical models describing the complete movement space.

Education

11.2016 **Ph.D. in Computer Science**, *Max Planck Institute for Informatics and Saarland University, Human-Computer Interaction group*, Saarbrücken, Germany.
Grade: very good (magna cum laude)
Thesis: "Biomechanical models for Human-Computer Interaction"
Advisors: Prof. Dr. Antti Oulasvirta and Prof Dr. Jürgen Steimle

09.2012 **M.Sc. in Computer Science**, *Saarland University*, Saarbrücken, Germany.
GPA 1.5 (Excellent)
Thesis: "Innovative Mobile Payment Concepts at Point-of-Sale"
Advisor: Prof. Dr. Antonio Krüger

06.2009 **B.Sc. in Computer Science**, *National University of "Kyiv-Mohyla Academy"*, Kyiv, Ukraine.
GPA 91.5 (Excellent)

06.2005 **Abitur**, *Zalishchyky State Gymnasium*, Zalishchyky, Ukraine.
GPA 11.3 (out of 12) (Excellent)

Employment

09.2017 – **Postdoctoral Researcher**, *Bayreuth University, Faculty of Mathematics, Physics and Computer Science*, Bayreuth, Germany.

04.2016 – 08.2017 **Postdoctoral Fellow**, *Aarhus University, Department of Computer Science*, Aarhus, Denmark.

10.2015 – 03.2016 **Postgraduate Visiting Researcher**, *University of Glasgow, School of Computing Science, Inference, Dynamics and Interaction Group*, Glasgow, U.K..

01.2013 – 09.2015 **Researcher**, *Cluster of Excellence on "Multimodal Computing and Interaction"*, Saarbrücken, Germany.

01.2012 – 12.2012 **Research Assistant**, *Max-Planck Institute for Informatics, Computer Graphics department, Human-Computer Interaction group*, Saarbrücken, Germany.

01.2011 – 08.2011 **Software Intern/Thesis project**, *B+S Card Service GmbH*, Frankfurt am Main, Germany.

12.2009 – 08.2010 **Research Assistant/Java Developer**, *German Research Center for Artificial Intelligence*, Saarbrücken, Germany.

11.2008 – 09.2009 **Java Developer**, *ZvitOperator (operator of an electronic document circulation)*, Kyiv, Ukraine.

Awards and Honors

2020 Honorable Mention Award for the full paper *Levitation Simulator: Prototyping Ultrasonic Levitation Interfaces in Virtual Reality* at ACM CHI 2020.

2018 Honorable Mention Award for the full paper *"LeviCursor: Dexterous Interaction with a Levitating Object"* at ACM ISS 2018.

2015 Honorable Mention Award for the full paper *"Performance and Ergonomics of Touch Surfaces: A Comparative Study Using Biomechanical Simulation"* at ACM CHI 2015.

2012 – 2013 Max-Planck scholarship for PhD studies

2010 – 2011 DAAD scholarship for Master studies

Selected Publications

[1] M. Bachinski and J. Müller, "Dynamics of aimed mid-air movements," in *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, CHI '20, (New York, NY, USA), ACM, 2020. to appear.

[2] V. Paneva, M. Bachinski, and J. Müller, "Levitation simulator: Prototyping ultrasonic levitation interfaces in virtual reality," in *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, CHI '20, (New York, NY, USA), ACM, 2020. to appear.

[3] T. Zindulka, M. Bachinski, and J. Müller, "Performance and experience of throwing in virtual reality," in *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, CHI '20, (New York, NY, USA), ACM, 2020. to appear.

[4] A. Heloir, F. Nunnari, and M. Bachynskyi, *Ergonomics for the Design of Multimodal Interfaces*, pp. 263–304. Association for Computing Machinery and Morgan & Claypool, 2019.

[5] M. Bachynskyi, V. Paneva, and J. Müller, "LeviCursor: Dexterous interaction with a levitating object," in *Proceedings of the 2018 ACM International Conference on Interactive Surfaces and Spaces*, ISS '18, (New York, NY, USA), pp. 253–262, ACM, 2018.

[6] M. Bachynskyi, G. Palmas, A. Oulasvirta, J. Steimle, and T. Weinkauf, "Performance and ergonomics of touch surfaces: A comparative study using biomechanical simulation," in *Proceedings of the 33rd Annual ACM Conference on*

Human Factors in Computing Systems, CHI '15, (New York, NY, USA), ACM, 2015.

[7] M. Bachynskyi, G. Palmas, A. Oulasvirta, and T. Weinkauf, "Informing the design of novel input methods with muscle coactivation clustering," *ACM Trans. Comput.-Hum. Interact.*, vol. 21, pp. 30:1–30:25, Jan. 2015.

[8] M. Bachynskyi, A. Oulasvirta, G. Palmas, and T. Weinkauf, "Is motion capture-based biomechanical simulation valid for hci studies?: Study and implications," in *Proceedings of the 32Nd Annual ACM Conference on Human Factors in Computing Systems*, CHI '14, (New York, NY, USA), pp. 3215–3224, ACM, 2014.

Teaching Portfolio

Head teaching assistant:

WS 19/20 **Introduction to computer science for the students of other disciplines**, *Bayreuth University*, Bachelor/Master, 49x90min.

SS 19 **Human-Computer Interaction I**, *Bayreuth University*, Bachelor/Master, 44x45min.

WS 18/19 **Human-Computer Interaction III**, *Bayreuth University*, Master, 13x90min.

WS 18/19 **Programming in Java**, *Bayreuth University*, Bachelor/Master, 28x90min.

SS 18 **Human-Computer Interaction I**, *Bayreuth University*, Bachelor/Master, 44x45min.

WS 17/18 **Programming in Java**, *Bayreuth University*, Bachelor/Master, 28x90min.

Lectures:

WS 19/20 **Lecture on "Ergonomics methods for Human-Computer Interaction" within the course on "Human-Computer Interaktion III"**, *Bayreuth University*, Master, 90min.

SS 19 **Lecture on "Biomechanics for Human-Computer Interaction" within the course on "Human-Computer Interaktion II"**, *Bayreuth University*, Bachelor/Master, 90min.

WS 18/19 **Lectures on "Android Programming" within the course on "Programming in Java"**, *University of Bayreuth*, Bachelor/Master, 4x90min.

SS 18 **Lecture on "Biomechanics for Human-Computer Interaction" within the course on "Human-Computer Interaktion II"**, *University of Bayreuth*, Bachelor/Master, 4x90min.

SS 17 **Video Lecture on "Biomechanics for Human-Computer Interaction" within the course on "Human-Computer Interaction"**, *University of Bayreuth*, Bachelor/Master, 90min.

SS 16 **Lecture on "Biomechanics for Human-Computer Interaction" within the course on "Augmented Reality"**, *Aarhus University*, Master, 90min.

SS 13 **Lecture on "Physical Ergonomics and Biomechanical Simulation" within the advanced course on "User Interface Optimization and Adaptation"**, *Saarland University*, Master, 90 min.

Seminars:

SS 18 **Block Seminar on "Game and Computer Science II"**, *Bayreuth University*, Master, 12x45min.

SS 18 **Block Seminar on "Game and Computer Science II"**, *Bayreuth University*, Master, 12x45min.

SS 14 **Seminar on "Biomechanical Simulation and Its Applications (78621)"**, *Saarland University*, Master, 12x90min, 5^{th} place among all seminars evaluated by students, Primary teacher.

Co-advising Bachelor's and Master's theses, and projects:

ongoing Laura Zeusel, Bayreuth University with Prof. Müller, Master's thesis.

ongoing Piyush Arora, Bayreuth University with Prof. Müller, Master's thesis.

ongoing Ashbeel Aslam, Bayreuth University with Prof. Müller, Master's thesis.

ongoing Saurabh Bagh, Bayreuth University with Prof. Müller, Master's thesis.

ongoing Carl-Philipp Hellmuth, Bayreuth University with Prof. Müller, Master's thesis.

ongoing Siegfried Althaus, Bayreuth University with Prof. Müller, Bachelor's thesis.

2020 Prakash Verma, Bayreuth University with Prof. Müller, Big Master's Project.

2020 Srihari Ramji, Bayreuth University with Prof. Müller, Big Master's Project.

2019 Michael Hochmuth, Bayreuth University with Prof. Müller, Bachelor's thesis.

2019 Tim Zindulka, Bayreuth University with Prof. Müller, Bachelor's thesis.

2019 Matthias Popp, Bayreuth University with Prof. Müller, Master's thesis.

2019 Svenja Süttenbach, Bayreuth University with Prof. Müller, Master's thesis.

2019 M Taqi Hussain, Bayreuth University with Prof. Müller, Big Master's Project.

Academic Service

Memberships

ACM (Association for Computing Machinery)

Reviewing

2020 ToCHI, AH

2019 CHI, UIST, IUI, MobileHCI

2018 CHI, UIST, ICMI

2017 CHI, AC at LBW track at CHI, UIST, MuC, ISS

2016 CHI

2015 CHI, INTERACT, MuC, IEEE ToHMS

2014 CHI

Skills and Expertise

Transferable skills	Complex problem solving, analytical thinking, design thinking, data management, informed decision making, independent work, commitment, project planning and management, project supervision, presentation design and public speaking.
Topics	Software Engineering, Algorithms and Data Structures, Data Management Systems, Distributed Systems, Machine Learning, Optimization, Robotics, Human-Computer Interaction, Physical Ergonomics, Biomechanical Modeling and Simulation, Ultrasonic Levitation, Computational Motor Control, Experimental Design, Data Analysis, Statistical Inference, Statistical Learning.
Languages & Technologies	Java, C/C++, Matlab & Simulink, Python, R, SQL, XML, HTML, PHP, CSS, Android, Qt, Boost, RegExp, LaTeX, MySQL, Postgres, NFC, EMV PayPass protocol, Bluetooth, NIDAQ, Phidgets, UltraHaptics, Optitrack NatNet.
Tools	Eclipse, Netbeans, PyCharm, Jupyter Lab, VisualStudio, QTCreator, Matlab, RStudio, Anaconda, Spyder, Git, SVN, Ant, Redmine, OpenSim, OptiTrack Motive , PhaseSpace Impulse, Microsoft Office, Adobe Photoshop, CorelDRAW, Sony Vegas, Blender.

Languages

English	fluent	Ukrainian	native
German	advanced	Russian	fluent

Talks and Exhibitions

10.2018	Poster presentation at ZD.B Symposium 2018, Kloster Frauenchiemsee, Germany
05.2016	Presentation at the Psychology department at Aarhus University, Aarhus, Denmark
03.2016	Interactive demo at the milestone meeting of the MoreGrasp project, Glasgow, Scotland, UK
10.2015	Presentation at Glasgow University, Scotland, UK
07.2015	Invited Talk at ETH Zürich, Zürich, Switzerland
06.2015	Invited Talk at Aarhus University, Aarhus, Denmark
06.2015	Invited Talk at the University of Valenciennes, Valenciennes, France
03.2015	Exhibition of *"Humans Under Physiological Stress Imposed by Touchscreen Devices"* at the CeBIT 2015, Hanover, Germany

Selected Media Coverage

12.2018	Article and the LeviCursor project video in **Daily Mail**
09.2016	An interview for **Die Zeit Doctor**
08.2015	An interview and a project video for **Nachtjournal**, broadcasted on *RTL* on the 6th August, `http://www.rtl.de/cms/news/rtl-nachtjournal.html`

03.2015 **Ergonomie: "Einfach mal den Kopf heben"**, an interview for *Der Spiegel*, N.12, p.109, `http://www.spiegel.de/spiegel/print/d-132327430.html`

03.2015 An interview and a project video for **Aktueller Bericht**, broadcasted on *SR1* on the 13th March, `http://sr-mediathek.sr-online.de/index.php?seite=7&id=31438`

03.2015 A project video for **Daily Planet**, broadcasted on *Discovery Channel Canada* on the 11th March