

YASEMIN VARDAR

Post Doctoral Researcher at the Max Planck Institute for Intelligent Systems

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RESEARCH INTERESTS

My research focuses on designing haptic devices and applications by considering the capabilities of human haptic perception. My goal is to build intelligent systems that enable delivering users with a wide variety of realistic and controllable haptic experiences.

EDUCATION

Ph.D. in Mechanical Engineering 09/2013 – 01/2018

Koç University, Istanbul, Turkey

Dissertation: Tactile Perception by Electro-vibration

Advisors: Prof. Dr. Cagatay Basdogan and Prof. Dr. Burak Güçlü

M.Sc. in Systems and Control 09/2010 – 08/2012

Eindhoven University of Technology, Eindhoven, The Netherlands

Dissertation: Estimation of MIMO Closed-loop Poles using Transfer Function Data

Advisor: Prof. Dr. Marteen Steinbuch and Dr. Niels van Dijk

B.Sc. (Exchange Student) in Electrical Engineering 01/2009 – 05/2009

University of Surrey, Guildford, United Kingdom

B.Sc. in Mechatronics Engineering 09/2005 – 07/2010

Sabancı University, Istanbul, Turkey

Graduation Project: Design and Control of 6 DOF Robotic Arm for Pick and Place Applications

Advisor: Prof. Dr. Kemalettin Erbatur

POSITIONS HELD

Assistant Professor (tenure track) – 09/2020 –

Delft University of Technology, Delft, The Netherlands

Faculty of 3ME, Cognitive Robotics Department

Delft Haptics Lab

Post Doctoral Researcher 02/2018 – Current

Max Planck Institute for Intelligent Systems, Stuttgart, Germany

Haptic Intelligence Department

Advisor: Dr. Katherine J. Kuchenbecker

Consultant 05/2019 – 05/2020

Tactai, Inc.

Research and Teaching Assistant 09/2013 – 01/2018

Koç University, Istanbul, Turkey

Control Engineer 10/2012 – 08/2013

TNO, Eindhoven, The Netherlands

Research Intern 12/2011 – 08/2012
Philips Innovation Technologies, Eindhoven, The Netherlands

Research Intern 09/2011 – 11/2012
ASML, Veldhoven, The Netherlands

AWARDS AND HONORS

Eurohaptics Society Best Ph.D. Thesis Award	2018
Sign Up! Career Building Program for Excellent Postdocs in the Max Planck Society	2018 – 2019
Best Poster Presentation Award, IEEE World Haptics Conference (with co-authors)	2018
Ph.D. Scholarship, Koç University	2013 – 2018
Ph.D. Scholarship, The Scientific and Technological Research Council of Turkey	2013 – 2017
Travel Grant, Koç University	2015 – 2017
Travel Grant, The Scientific and Technological Research Council of Turkey	2016
M.Sc. Scholarship, Eindhoven University of Technology	2010 – 2012
M.Sc. Scholarship, The Scientific and Technological Research Council of Turkey (waived)	2010 – 2012
B.Sc. Prime Minister Scholarship, Turkish Prime Minister Foundation	2005 – 2010
Erasmus Scholarship, Socrates Program	2009
B.Sc. Honor Scholarship, Sabancı University	2005 – 2010
Graduation with honors, Sabancı University	2012

PUBLICATIONS

Unpublished Publications (Submitted or under review)

- [U1]. Cara M. Nunez, **Yasemin Vardar**, and Katherine J. Kuchenbecker. Insights into human perception of asymmetric vibrations via dynamic modeling. Submitted working progress abstract for *Eurohaptics*, 2020
- [U2]. **Yasemin Vardar**, Bernard Javot, and Katherine J. Kuchenbecker. Do finger touch gestures affect how electrovibration feels? Submitted for a hands-on demonstration at *Eurohaptics*, 2020
- [U3]. **Yasemin Vardar**. Tactile Perception by Electro vibration. In press *Springer Series on Touch and Haptic Systems*, Springer International Publishing.
- [U4]. **Yasemin Vardar** and Katherine J. Kuchenbecker. Finger Gestures Influence the Tactile Perception of Electro vibration, *Under review for Science Advances*.

Journal Papers

- [J1]. Saekwang Nam, **Yasemin Vardar**, David Gueorguiev, and Katherine J. Kuchenbecker. Physical Variables Underlying Tactile Stickiness During Fingerpad Detachment. *Frontiers in Neuroscience*, 14(235), 2020, doi:10.3389/fnins.2020.00235
- [J2]. Aykut İşleyen, **Yasemin Vardar**, and Cagatay Basdogan. Tactile Roughness Perception of Virtual Gratings by Electro vibration. *IEEE Transactions on Haptics*, 2019
- [J3]. **Yasemin Vardar**, Burak Güçlü, and Cagatay Basdogan. Tactile Masking by Electro vibration, *IEEE Transactions on Haptics*, 11(4):623–635, 2018
- [J4]. **Yasemin Vardar**, Burak Güçlü, and Cagatay Basdogan. Effect of Waveform on Tactile Perception of Electro vibration Displayed on Touchscreens, *IEEE Transactions on Haptics*, 10(4):488–499, 2017

Peer-Reviewed Conference Papers (min. 6 pages)

- [C1]. **Yasemin Vardar**, Christian Wallraven, and Katherine J. Kuchenbecker. Fingertip interaction metrics correlate with visual and haptic perception of real surfaces. *In Proceedings of the IEEE World Haptics Conference (WHC)*, pages: 395-400, Tokyo, Japan, July 2019
- [C2]. Milad Jamalzadeh, Burak Güçlü, **Yasemin Vardar**, and Cagatay Basdogan. Effect of remote masking on detection of electrovibration. *In Proceedings of the IEEE World Haptics Conference (WHC)*, pages: 229-234, Tokyo, Japan, July 2019
- [C3]. Tamara Fiedler and **Yasemin Vardar**. A novel texture rendering approach for electrostatic displays. *In Proceedings of the International Workshop on Haptics and Audio Interaction Design (HAID)*, Lille, France, March 2019
- [C4]. **Yasemin Vardar**, Aykut İşleyen, Khurram M. Saleem, and Cagatay Basdogan. Roughness perception of virtual textures generated via electrovibration on touchscreens. *In Proceedings of the IEEE World Haptics Conference (WHC)*, pages: 263-268, Munich, June 2017
- [C5]. **Yasemin Vardar**, Burak Güçlü, and Cagatay Basdogan. Effect of waveform in haptic perception by electrovibration on touchscreens. *In Haptics: Perception, Devices, Control and Applications: 10th International Conference Eurohaptics 2016*, London, UK, July 4-7, Proceedings, Part I, 10(4):190-203, 2016
- [C6]. Marceel F. Heertjes and **Yasemin Vardar**. Sliding mode control of high precision systems. *In IFAC Proceedings Volumes*, 46(5):13-19, 2013

Hands-on Demonstrations

- [D1]. **Yasemin Vardar** and Katherine J. Kuchenbecker. Do finger touch gestures affect how electrovibration feels? Accepted for hands-on demonstration at *IEEE Haptics Symposium*, 2020
- [D2]. Tamara Fiedler, **Yasemin Vardar**, Matti Strese, Eckehard Steinbach, and Cagatay Basdogan. Reproduction of textures based on electrovibration: a frequency domain approach. *Hands-on demonstration presented in the IEEE World Haptics Conference*, 2017
- [D3]. Senem Ezgi Emgin, Bushra Sadia, **Yasemin Vardar**, and Cagatay Basdogan. Enhancing human-computer interaction via electrovibration. *Hands-on demonstration presented in the IEEE World Haptics Conference*, 2017

Abstracts

- [A1]. **Yasemin Vardar**, Christian Wallraven, and Katherine J. Kuchenbecker. Fingertip interaction metrics correlate with visual and haptic perception of real surfaces. *Abstract at the DyVito Bilkent Cappadocia Workshop*, November 2019
- [A2]. **Yasemin Vardar**, Christian Wallraven, and Katherine J. Kuchenbecker. Fingertip interaction metrics correlate with visual and haptic perception of real surfaces. *Abstract at the Workshop Materials and Haptics*, February 2019
- [A3]. **Yasemin Vardar**, Burak Güçlü, and Cagatay Basdogan. Tactile Masking by Electro vibration. *Extended abstract at the 2018 CSF Hand, Brain, and Technology Conference (HBT)*, August 2018

GRANTS

MPI Grassroots 2020 Project Funding

01/2020 – 01/2021

Development of a Surface Haptic Display using Liquid Crystal Elastomers for Softness Sensation Rendering

Role: PI at Haptic Intelligence Department

PI's at Physical Intelligence Department: Hamed Shahsavan and Amirreza Aghakhani

Grant Amount: 24000 Euro

ADVISING

Interns

Elisa Loffler (High school student) 11/2018 – 02/2019

Tamara Fiedler (M.Sc. student) 06/2016 – 08/2016

Part-time Working Students

Kota Sanjeev Vishal (M.Sc. Student) 06/2020 – Current

Luzia Knoedler (M.Sc. student) 10/2019 – 01/2020

Shao Wen Wu (M.Sc. student) 02/2019 – 08/2019

Graduation Project Students

Batuhan Özer (B.Sc. student) 01/2015 – 06/2015

Batu Berke Özdemir (B.Sc. student) 01/2015 – 06/2015

Nihat İskender (B.Sc. student) 01/2015 – 06/2015

Mentored Students at Specific Projects (not as the main advisor)

Maria Paola Forte (Ph.D. student) 01/2020 – Current

Saekwang Nam (Ph.D. student) 05/2019 – 10/2019

Milad Jamalzadeh (M.Sc. student) 09/2017 – 04/2019

Aykut İşleyen (M.Sc. student) 09/2016 – 01/2019

INSTRUCTION AND COURSE DEVELOPMENT

Introduction to Matlab Programming

to be determined

The course is intended for programming beginners and will therefore cover basic topics. The course will introduce elements common to programming languages (e.g. variables and operators, data types, control flow, file input/output) and point to techniques and concepts specific to Matlab. These include scalar expansion, logical subscripting, reshaping and other high-level manipulation of arrays, high-level graphics commands, scripts vs. functions, speed and memory issues, graphical user interfaces.

University of Tübingen, Germany; co-lecture with Dr. Hasti Seifi

Others

09/2013 – 01/2018

I worked as a teaching assistant of the courses Mechanical Engineering Design (Fall 2013 – 2015, 2017), Dynamic Modelling and Control (Spring 2014 – 2017), and Natural Sciences (Fall 2016).

Koç University

PROFESSIONAL SERVICES

Institutional Services

Member of the Demo Team, Haptic Intelligence Department, MPI-IS 2018 – Current

Human Subjects Coordinator, Haptic Intelligence Department, MPI-IS 2019

Member of the IT Community, MPI-IS 2018

Organizational Help

Program Committee Member of IEEE Haptics Symposium, 2020 – 2022

Session chair, IMPRS-IS Symposium, 2019

Designer of sponsorship page and proceedings cover pages, IEEE Haptics Symposium 2018

Volunteer for organizing Athena Meet and Greet Event for International Women in Science Day, 2018

Student volunteer, IEEE World Haptics Conference, 2017

Reviews

Journal Paper Reviews

IEEE Transactions on Mechatronics, IEEE Transactions on Haptics, The Computer Journal, International Journal of Automation and Computing, International Journal of Human-Computer Interaction, Robotics and Automation Letters, International Journal of Human-Computer Studies, Applied Perception, Neuroscience Letters, Scientific Reports

Conference Paper Reviews

Eurohaptics 2018-2020, IEEE World Haptics 2017-2019, TORC 2017, ICRA 2019, IROS 2019, IEEE Haptics Symposium 2018-2020, HRI 2019

PRESENTATIONS

Invited Seminars

The Journey Towards Realistic Haptic Displays, Carnegie Mellon University, The Robotics Institute, Pittsburgh, February, 2020

The Journey Towards Realistic Haptic Displays, Delft University of Technology, Delft, The Netherlands, February, 2020

The Journey Towards Realistic Haptic Displays, Texas A&M University, College Station, USA, January, 2020

The Journey Towards Realistic Haptic Displays, University of Wisconsin-Madison, Madison, USA, December, 2019

The Journey Towards Realistic Haptic Displays, Washington State University, Pullman, USA, December, 2019

Tactile Perception of Electro-vibration Displayed on Touchscreens, Max Planck Institute for Cognitive and Brain Sciences, Leipzig, Germany, November, 2019

Tactile Perception by Electro-vibration, Eurohaptics Society Best Ph.D. Thesis Award talk, IEEE World Haptics Conference, Tokyo, Japan, July, 2019

Generation of haptic feedback on touchscreens via electro-vibration, Facebook Reality Labs, Seattle, USA, June, 2019

Fingertip interaction metrics correlate with visual and haptic perception of real surfaces, Material Science and Haptics Workshop, Saarbrücken, Germany, February, 2019

Understanding the physics behind electro-adhesion, University of Tübingen, Tübingen, Germany, 2018

Effect of waveform on tactile perception of electro-vibration displayed on touchscreens, Max Planck Institute for Intelligent Systems, Stuttgart, Germany, July, 2017

Educational Talks, Workshops, and Panel Discussions

Paper reviewing techniques, Panel Discussion in the Haptic Intelligence Department, Max Planck Institute for Intelligent Systems, Stuttgart, Germany, 2019

Tips for faculty job search, Panel Discussion in the Haptic Intelligence Department, Max Planck Institute for Intelligent Systems, Stuttgart, Germany, 2019

Career Building Strategies for Postdocs and Ph.D. Students, Max Planck Institute for Intelligent Systems, Stuttgart, Germany, 2019

Tactile perception by electro-vibration, Workshop Presentation at the IEEE World Haptics Conference 2017, Munich, Germany, June, 2017

Technical Paper Presentations

Fingertip interaction metrics correlate with visual and haptic perception of real surfaces, MPI-IS Retreat, 2019

Fingertip interaction metrics correlate with visual and haptic perception of real surfaces, IEEE World Haptics Conference 2019, Tokyo, Japan, July, 2019

Effect of remote masking on detection of electrovibration, IEEE World Haptics Conference 2019, Tokyo, Japan, July, 2019

A novel texture rendering approach for electrostatic displays, International Workshop on Haptics and Audio Interaction Design 2019, Lille, France, March, 2019

Effect of waveform in haptic perception of electrovibration, IEEE World Haptics Conference 2016, London, UK, June, 2016

Poster Presentations

Fingertip interaction metrics correlate with visual and haptic perception of real surfaces, DyVito Workshop, Cappadocia, Turkey, November, 2019

Tactile masking by electrovibration, IEEE World Haptics Conference 2019, Tokyo, Japan, July, 2019

Visual and Haptic Perception of Real Surfaces, MPI-IS Scientific Advisory Board Poster Presentation, 2019, Tübingen, Germany

Technical paper presentation, Tactile masking by electrovibration, Hand Brain and Technology Conference 2018, Ascona, Switzerland

Effect of waveform on tactile perception of electrovibration displayed on touchscreens, Haptics Symposium 2018, San Francisco, USA

Roughness perception of virtual textures displayed by electrovibration on touchscreens, IEEE World Haptics Conference 2017, Munich, Germany

SCIENTIFIC AND PROFESSIONAL SOCIETIES

Institute for Electrical and Electronic Engineers (IEEE), Robotics and Automation Society

Eurohaptics Society

ATHENA, Society of Female Scientists at Planck Institute for Intelligent Systems

Society of Women Engineers at Koç University

OUTREACH

Panel discussion, *Career paths for mechatronics engineers*, Fethiye Science High School, Mugla, Turkey, March, 2020

Panel discussion, *Career paths for mechatronics engineers*, Mehmet Erdogan Anatolian High School, Mugla, Turkey, 2012

Civic Involvement Project, Sabanci University, 2005

MEDIA HIGHLIGHTS

Press release documented by Linda Behringer: Yasemin Vardar wins the Eurohaptics Society Best Ph.D. Award 2018, July 2019

Press release documented by Hande Sarantopoulos: Yasemin Vardar received the Eurohaptics Society Best Ph.D. Award 2018, July 2019