

# YASEMIN VARDAR

Assistant Professor at the Delft University of Technology

Address: Mekelweg 2, Delft, The Netherlands ◊ Email: [Y.Vardar@tudelft.nl](mailto:Y.Vardar@tudelft.nl)

Web Personal: <https://yaseminvardar.com/> ◊ Web Lab: <https://sites.google.com/view/hitlabdelft>

## RESEARCH INTERESTS

---

My research aims to create natural, compelling, and customizable haptic interactions in virtual environments. I investigate the skin deformations that occur during interactions with natural surfaces or tactile interfaces and the resulting perceptual experiences. I also design new haptic interfaces and rendering algorithms to emulate realistic touch experiences in virtual environments. I am interested in applying my research to communication, medicine, education, and human-robot interaction fields.

## EDUCATION

---

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

Koç University, Istanbul, Turkey

Dissertation: Tactile Perception by Electrovibration

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** 09/2020 – Current

Delft University of Technology, Delft, The Netherlands

Faculty of 3ME, Cognitive Robotics Department

**Guest Scientist** 09/2020 – Current

Max Planck Institute for Intelligent Systems, Stuttgart, Germany

Haptic Intelligence Department

**Post Doctoral Researcher** 02/2018 – 09/2020

Max Planck Institute for Intelligent Systems, Stuttgart, Germany

Haptic Intelligence Department

Advisor: Dr. Katherine J. Kuchenbecker

**Consultant** 05/2019 – 05/2020

Tactai, Inc.

<b>Research and Teaching Assistant</b> Koç University, Istanbul, Turkey	09/2013 – 01/2018
<b>Control Engineer</b> TNO (Netherlands Organisation for Applied Scientific Research) Eindhoven, The Netherlands	10/2012 – 08/2013
<b>Research Intern</b> Philips Innovation Technologies, Eindhoven, The Netherlands	12/2011 – 08/2012
<b>Research Intern</b> ASML, Veldhoven, The Netherlands	09/2011 – 11/2012

## PUBLICATIONS

---

*Unpublished Publications (Submitted, under review, or in preparation)*

- [U1]. Maria P. Forte, **Yasemin Vardar**, and Katherine J. Kuchenbecker. *Under review for Intelligent User Interfaces Conference (UIST) 2021.*
- [U2]. Gokhan Serhat\*, **Yasemin Vardar\***, and Katherine J. Kuchenbecker. Contact area evolution of dry and hydrated fingertips at initial touch. *In preparation.*
- [U3]. **Yasemin Vardar\***, Benjamin Richardson\*, Christian Wallraven, and Katherine J. Kuchenbecker. Learning to feel textures. *In preparation.*

*Journal Papers*

- [J1]. **Yasemin Vardar** and Katherine J. Kuchenbecker. Finger motion and contact by a second finger influence the tactile perception of electrovibration, *Journal of the Royal Society Interface*, Accepted.
- [J2]. 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
- [J3]. Aykut İşleyen, **Yasemin Vardar**, and Cagatay Basdogan. Tactile Roughness Perception of Virtual Gratings by Electro vibration. *IEEE Transactions on Haptics*, 2019
- [J4]. **Yasemin Vardar**, Burak Güçlü, and Cagatay Basdogan. Tactile Masking by Electro vibration, *IEEE Transactions on Haptics*, 11(4):623–635, 2018
- [J5]. **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

*Books*

- [B1]. **Yasemin Vardar**. Tactile Perception by Electro vibration. 2020. *Springer Series on Touch and Haptic Systems*, Springer International Publishing.

*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 electro vibration. *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

*Peer-Reviewed Hands-on/Interactive Demonstrations*

- [D1]. Bence L. Kodak and **Yasemin Vardar**. FeelPen: A Stylus with Multimodal Haptic Feedback for Touchscreens. Interactive demonstration at *IEEE World Haptics Conference*, 2021.
- [D2]. Rebecca F. Friesen and **Yasemin Vardar**. Preserving Texture Realism Across Remote Actuator Placement and Variable Fingertip Velocity, Interactive demonstration at *IEEE World Haptics Conference*, 2021.
- [D3]. **Yasemin Vardar**, Bernard Javot, and Katherine J. Kuchenbecker. Do finger touch gestures affect how electrovibration feels? Hands-on demonstration at *Eurohaptics*, 2020
- [D4]. **Yasemin Vardar** and Katherine J. Kuchenbecker. Do finger touch gestures affect how electrovibration feels? Accepted (cancelled due to COVID 2019) for hands-on demonstration at *IEEE Haptics Symposium*, 2020
- [D5]. 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
- [D6]. 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

*Datasets*

- [S1]. **Yasemin Vardar** and Katherine J. Kuchenbecker. Dataset for Finger motion and contact by a second finger influence the tactile perception of electrovibration, Dryad, Dataset, 2021, doi:10.5061/dryad.9ghx3ffgp

*Peer-Reviewed Abstracts and Work in Progress Papers*

- [A1]. Rebecca F. Friesen and **Yasemin Vardar**. Exploration of Velocity-dependent Scaling Methods for a Wearable Vibrotactile Texture Display. Work in progress paper, *IEEE World Haptics Conference*, 2021.
- [A2]. Cara M. Nunez, **Yasemin Vardar**, and Katherine J. Kuchenbecker. Insights into human perception of asymmetric vibrations via dynamic modeling. Work in progress poster presented at the *Eurohaptics*, September 2020
- [A3]. **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

- [A4]. **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
- [A5]. **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

\* These authors contributed equally.

Underlining marks individuals whom I officially supervised for the published research.

## AWARDS AND HONORS

---

Eurohaptics Society Best Ph.D. Thesis Award 2018	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

## GRANTS

---

<b>3ME Cohesion Grant 2021, Delft University of Technology</b>	01/2021 – 01/2022
Enabling Future Gadgets to Communicate via Touch	
Role: PI at Cognitive Robotics Department	
PI at Precision and Micro Systems Engineering Department: Andres Hunt	
Grant Amount: 60K Euro	
<b>Grassroots 2020, Max Planck Institute for Intelligent Systems</b>	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: 24K Euro	

## ADVISING

---

### *Postdocs*

Rebecca Fenton Friesen, Ph.D.	11/2020
Postdoctoral Researcher at Delft University of Technology, Netherlands	

### *Master Thesis Students*

Bence Levente Kodak	02/2021 – Current
M.Sc. student at Delft University of Technology, Netherlands	
Valerie de Vlam (co-advised with Michael Wiertlewski)	01/2021 – Current
M.Sc. student at Delft University of Technology, Netherlands	

Luka Peters M.Sc. student at Delft University of Technology, Netherlands	01/2021 – Current
Yves Onnink (co-advised with Laura Marchal Crespo) M.Sc. student at Delft University of Technology, Netherlands	11/2020 – Current

*Part-time Working Students*

Kota Sanjeev Vishal M.Sc. student in Micro and Nano Systems at Chemnitz University of Technology, Germany	06/2020 – 12/2020
Luzia Knoedler Was a M.Sc. student in Engineering Cybernetics at University of Stuttgart, Germany Did her master thesis at Robert Bosch GmbH, Germany Now a Ph.D. student with Javier Alonso Mora at Delft University of Technology	10/2019 – 01/2020
Shao Wen Wu Was a M.Sc. student in Information Technology at University of Stuttgart, Germany Now an IT specialist at ING Bank, Amsterdam, Netherlands	02/2019 – 08/2019

*Interns*

M. Sinan Arca B.Sc. student at Bogazici University, Istanbul, Turkey Project: Material Recognition from Images via Deep Neural Networks	07/2021 – 09/2021
Ratnagshu Das B.Sc. student at Indian Institute of Technology, Kanpur, India Project: Dynamic Modeling of Finger-Voice-Coil (Haptuator) Contact	05/2021 – 08/2021
Luka Peters M.Sc. student at Delft University of Technology, Netherlands Project: Displaying Localized Thermal Feedback on a Transparent Surface	09/2020 – 01/2021
Bence Levente Kodak M.Sc. student at Delft University of Technology, Netherlands Project: Design of a Pen-Type Multi-Modal Haptic Interface	09/2020 – 01/2021
Elisa Loffler Was a high-school student in Stuttgart, Germany	11/2018 – 02/2019
Tamara Fiedler Was a M.Sc. student at Munich University of Technology Now Technology Portfolio Manager at BSH Home Appliances Group, Germany	06/2016 – 08/2016

*Graduation Project Students*

Batuhan Özer Was a B.Sc. student at Koc University, Turkey Now a Senior Management Consultant at Ernst&Young	01/2015 – 06/2015
Batu Berke Özdemir Was a B.Sc. student at Koc University, Turkey Now a Senior Assistant Brand Manager at Unilever	01/2015 – 06/2015
Nihat İskender Was a B.Sc. student at Koc University, Turkey	01/2015 – 06/2015

*Thesis Committees*

- 2021: M.Sc. Thesis Committee, Manish Gunalan (supervised by Barys Shrokaeu)  
M.Sc. Thesis Committee, Gailey Leseman (supervised by Dick Plettenburg)
- 2020: Ph.D. Go/No Go Committee, Padmaja Kulkarni (supervised by Robert Babuska, Jens Kober, and Cosimo Della Santina)

## INSTRUCTION AND COURSE DEVELOPMENT

---

### Fellow Instructor

Applied Experimental Methods, Delft University of Technology, April-June 2021

### Invited Lectures

Enabling Haptic Effects on Consumer Electronics, *Control of Human-Robot Interaction Course*, Delft University of Technology, February 2021

Tactile Interfaces for Human-Robot Interaction & Human Tactile Sensation, *Human-Robot Interaction Course*, Delft University of Technology, January 2021

### University Teaching Qualification - TU Delft

Supervise

### Teaching Assistant

Mechanical Engineering Design (Fall 2013 – 2015, 2017), Dynamic Modelling and Control (Spring 2014 – 2017), and Natural Sciences (Fall 2016), Koç University

## PROFESSIONAL SERVICES

---

### Organizational Help

Co-Chair of the IEEE Technical Committee on Haptics	2021
Student Volunteer Co-Chair, IEEE World Haptics Conference 2021	2020–2021
Organization Team Member, Networking Event for Tenure Trackers of 3ME Faculty	2020
Session chair, IMPRS-IS Symposium	2020
Designer of sponsorship page and proceedings cover pages, IEEE Haptics Symposium	2018
Organization Team, Athena Meet and Greet Event for International Women in Science Day	2018
Student volunteer, IEEE World Haptics Conference	2017

### Editorial Services

Associate Editor in IEEE World Haptics Conference 2021	2021
Review Editor, Frontiers in Virtual Reality	2020 – Current
Associate Editor in IEEE Haptics Symposium 2020-2022	2020 – 2022

### 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, Human Factors and Ergonomics Society

#### *Conference Paper Reviews*

MobileHCI 2021, Eurohaptics 2018-2020, IEEE World Haptics 2017-2021, TORC 2017, ICRA 2019, IROS 2019, IEEE Haptics Symposium 2018-2020, HRI 2019

#### *Grant Proposal Reviews*

MPI Grassroots 2020

### Institutional Services

Student Colloquia Co-Chair, TU Delft Cognitive Robotics Department, 2020	2021
--	------

Staff Meeting Co-Chair, TU Delft Cognitive Robotics Department, 2020	2020
Member of the Demo Team, Haptic Intelligence Department, MPI-IS	2018 – 2020
Human Subjects Coordinator, Haptic Intelligence Department, MPI-IS	2019
Member of the IT Community, MPI-IS	2018

## PRESENTATIONS

---

### *Invited Seminars*

The Journey Towards Realistic Haptic Displays, Koc University, Istanbul, Turkey, November, 2020 (virtual seminar)

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 Electrovibration Displayed on Touchscreens, Max Planck Institute for Cognitive and Brain Sciences, Leipzig, Germany, November, 2019

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

Generation of haptic feedback on touchscreens via electrovibration, 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 electrovibration displayed on touchscreens, Max Planck Institute for Intelligent Systems, Stuttgart, Germany, July, 2017

### *Educational Talks, Workshops, and Panel Discussions*

PHD or not to PHD?, Asimov PhD Speaker Event, Delft University of Technology, April, 2021

Tactile Perception of Electrovibration Displayed on Touchscreens, Afiliated Talk for Tactile Research Group, Psychonomic Society Annual Meeting, November, 2020 (virtual seminar)

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 electrovibration, 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 (2015 – Current)

Eurohaptics Society (2018 – Current)

Tactile Research Group (2020 – Current)

DEWIS, The Women Network of Scientists at the TU Delft (2020 – Current)

ATHENA, Society of Female Scientists at Planck Institute for Intelligent Systems (2018 – 2020)

Society of Women Engineers at Koç University (2013 - 2018)

## **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: [Challenging the design of electrovibration to generate a more realistic feel](#)

Press release documented by Valerie Callaghan: [Three scientists from MPI-IS Stuttgart accept appointments at top universities across Europe](#)

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

## **LANGUAGES**

---

Turkish (native), English (professional), German (B1), Dutch (A2)