

# Thomas Feix

## Curriculum Vitae

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### Positions Held

- 2022 – **CreateMe Technologies LLC**, *San Francisco, CA - out of the Vancouver, WA office*, Principal Automation Engineer.  
Developing new apparel production technologies, pushing the state of the art.
- 2019 – 2021 **Adidas AG**, *Herzogenaurach, Germany*, Senior Manager Mechanical Engineering.
- Leading the mechanical, manufacturing and IT team embedded in the innovation department, bringing disruptive innovations to the footwear and apparel range.
  - Maximizing team impact by setting strategic position and promoting growth of team members.
  - Successfully navigating between short term deliverables and long term explorations.
  - Team creates 1-2 patents per year.
- 2015 – 2019 **Adidas AG**, *Herzogenaurach, Germany*, Manager Robotics Engineering.
- Key contact in the adidas innovation team for robotics and automation.
  - Managing relations to academic and industrial partners to support and initiate innovation projects.
  - Created demonstrators to showcase where robotics can bring value to adidas in both production and consumer facing settings.
  - Developed motion planning solutions that went beyond the state of the art in robotics.
  - **Part of the team that won the German Innovation Award 2018 for Speedfactory.**
- 2012 – 2015 **Yale University**, *New Haven, CT, USA*, Post Doctoral Researcher.
- Authored many publications in world leading robotics, biomedical and haptics journals. Currently cited over 1200 times.
  - Established myself as a world leading expert in human grasping and interaction.
  - Worked embedded in a robotics group, bridging the gap between human and robotic grasping.
- 2008 – 2012 **Otto Bock HealthCare GmbH**, *Vienna, Austria*, PhD Researcher.
- Working within the European robotics research project GRASP (almost 8mio€ budget, 10 partners distributed throughout Europe)
  - Representative of Otto Bock within project, aligning company with project goals.
  - Used unsupervised machine learning methods to benchmark the human hand to prosthetic and robotic hands.
- 2007 **Olympic Centre**, *Linz, Austria*, Software engineer.  
Data acquisition and programming of an analysis software tool
- 2006 – 2007 **University of Vienna**, *Institute for Sport Science, Department of Biomechanics, Kinesiology and Applied Computer Science*, Internship.  
Continuing the development of a tennis racket test bench  
Working on master thesis

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## Education

- 2008 – 2011 **Vienna University of Technology**, *PhD Mechanical Engineering*, graduated with distinction.  
Supervisors: Prof. Heinz-Bodo Schmiedmayer (TU Vienna) and Prof. Danica Kragic (KTH Stockholm)  
PhD Thesis: “Anthropomorphic Hand Optimization based on a Latent Space Analysis”
- 2003 – 2007 **University of Applied Sciences Technikum Wien**, *Diploma Study Sports Equipment Technology*, graduated with distinction.  
Master thesis: “Construction and application of a modular ski test bench”
- 2004 – 2008 **University of Vienna**, *Diploma Study Physics*.  
completed 133 ETCS credits

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## Qualifications

### Languages

- German Native language  
English Fluent

### Engineering Expertise

- Languages Matlab, Python, R  
CAD Pro-Engineer, SolidWorks, Onshape  
Motion Peak Motus, Simi Motion, Vicon Nexus, Ascension TrakSTAR Capture  
Robotics KUKA iiwa (Sunrise), RoboDK, Mecademic  
Miscellaneous Latex, MS Office, Inkscape, Ardiuno

### Interests

- Sports Tennis, Snowboard, Ski  
DIY Woodworking, electronics, 3D printing, programming; some projects presented *here*  
Other Chasing my two little kids, reading, travelling, cooking
- 2020 Key member of the team that developed the new FUTURECRAFT.STRUNG upper technology of adidas. *Link*
- 2019 One team member is technical lead for adidas space projects. *Link*
- 2018 Key person for robotic installation that created Speedfactory shoe uppers during LA All Star Weekend in Los Angeles, USA
- 2016 Omron Adept mobile robot basic training
- 2010 10th International UJI Robotics School, Summer School on Robotic Grasping; Sept. 2010, Bannicassim, Spain
- 2008 Otto Bock product training lower & upper extremity
- 2008 AUSTRAMED seminar on Medicinal Devices Act
- 2007 Inventor of patent AT 502801
- 2005 Basic Snowboard coach
- 2005 Basic Tennis coach

2002 – 2003 Mandatory military service

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## Academic Activities

### Refereeing

- Journals ASME Journal of Mechanisms and Robotics, IEEE Transactions on Robotics, Robotics and Autonomous Systems, IEEE Transactions on Human-Machine Systems, Journal of Theoretical Biology, Journal of Computational Design and Engineering, IEEE RA-L
- Conferences IEEE World Haptics Conference, IEEE-RAS International Conference on Humanoid Robots, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), IEEE International Conference on Robotics and Automation (ICRA), IEEE Engineering in Medicine and Biology Society (EMBC), ACM/IEEE International Conference on Human-Robot Interaction (HRI), ROB|ARCH, International Symposium on Robotics Research (ISRR)

### Invited Talks

- 2019 *Introduction to the adidas innovation program*, Stuttgart Symposium for Product Development, Stuttgart, Germany, May 16-17, 2019
- 2018 *Presentation on grasp taxonomies and textile innovation at adidas*, BarcelonaTech, Barcelona, Spain, June 20, 2018
- 2017 *Human Grasp Taxonomies*, Summer School on Soft Manipulation, Lake Chiemsee, Germany, July 17-21, 2017
- 2016 *Understanding Human Hands, Grasping and Manipulation*, Universitat Jaume I, Castelló de la Plana, Spain, March 11, 2016
- 2014 *Modeling of Precision Grip in Primates*, Hand, Brain and Technology, CSF Conference, Monte Verità, Switzerland, September 7-12, 2014
- 2010 *GP-LVMs for studying human grasping actions*, Robotics: Science and Systems Conference, workshop on Representations for Object Grasping and Manipulation in Single and Dual Arm Tasks

### Memberships

- IEEE Institute of Electrical and Electronics Engineers
- ÖSG Österreichische Sportwissenschaftliche Gesellschaft, Austrian Sport Science Association

### Teaching Experience

- 2014 **Developing and Assessing Students' Critical Thinking Skills**, *Yale University*. Attended a one-day workshop on alternative teaching approaches, modern classroom tools and student assessment.
- 2006 – 2007 **Teaching assistant**, *Introduction to sports informatics and statistics*. Supporting students during their assignments.
- 2006 – 2007 **Laboratory assistant**, *Biomechanical Motion Capture Methods*. Demonstration of measurement techniques (motion capture, high speed cameras, force plates) and assisting students during their projects.

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## Publications

Thomas Weingartshofer, Christian Hartl-Nesic, and Andreas Kugi. Optimal tcp and robot base placement for a set of complex continuous paths. In *2021 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE, 2021, accepted. **I led this project from adidas side that resulted in this publication.**

**T. Feix**, Ian M. Bullock, Yuri Gloumakov, and Aaron M. Dollar. Effect of number of digits on human precision manipulation workspaces. *IEEE Transactions on Haptics*, 14(1):68–82, 2021.

Christian Hartl-Nesic, Tobias Glück, and Andreas Kugi. Surface-based path following control: Application of curved tapes on 3-d objects. *IEEE Transactions on Robotics*, 2020. **I led this project from adidas side that resulted in this publication.**

**T. Feix**, I. M. Bullock, Y. Gloumakov, and A. M. Dollar. Effect of Number of Digits on Human Precision Manipulation Workspaces. *IEEE Transactions on Haptics*, 2020.

**T. Feix**, J. Romero, H.B. Schmiedmayer, A.M. Dollar, and D. Kragic. The GRASP Taxonomy of Human Grasp Types. 46(1):66–77, Feb 2016.

M. Tavakoli, B. Enes, L. Marques, and **T. Feix**. Actuation Configurations of Bionic Hands for a Better Anthropomorphism Index. *Journal of Mechanisms and Robotics*, 8, 2016.

Y. Gloumakov, **T. Feix**, I. M. Bullock, and A. M. Dollar. Object stability during human precision fingertip manipulation. In *2016 IEEE Haptics Symposium (HAPTICS)*, pages 84–91, April 2016.

**T. Feix**, T. L. Kivell, E. Pouydebat, and A. M. Dollar. Estimating thumb–index finger precision grip and manipulation potential in extant and fossil primates. *Journal of The Royal Society Interface*, 12(106), 2015. **Covered by Austrian and international media.**

I. M. Bullock, **T. Feix**, and A. M. Dollar. Workspace Shape and Characteristics for Human Two- and Three-Fingered Precision Manipulation. *IEEE Transactions on Biomedical Engineering*, 62(9):2196–2207, Sep. 2015.

I. M. Bullock, **T. Feix**, and A. M. Dollar. Human Precision Manipulation Workspace: Effects of Object Size and Number of Fingers Used. In *IEEE Engineering in Medicine and Biology Society (EMBC)*, pages 5768–5772, Aug 2015.

**T. Feix**, I.M. Bullock, and A. M. Dollar. Rotational Ranges of Human Precision Manipulation When Grasping Objects With Two to Five Digits. In *IEEE Engineering in Medicine and Biology Society (EMBC)*, pages 5785–5790, Aug 2015.

I. M. Bullock, **Feix, T.**, and A. M. Dollar. The Yale human grasping dataset: Grasp, object, and task data in household and machine shop environments. *The International Journal of Robotics Research*, 34(3):251–255, March 2015.

I. M. Bullock, **T. Feix**, and A. M. Dollar. Analyzing Human Fingertip Usage in Dexterous Precision Manipulation: Implications for Robotic Finger Design. In *IEEE/RSJ*

*International Conference on Intelligent Robots and Systems*, pages 1622–1628, September 2014.

**T. Feix**, I. M. Bullock, and A. M. Dollar. Analysis of Human Grasping Behavior: Correlating Tasks, Objects and Grasps. *IEEE Transactions on Haptics*, 7(4):430–441, October 2014.

**T. Feix**, I. M. Bullock, and A. M. Dollar. Analysis of Human Grasping Behavior: Object Characteristics and Grasp Type. *IEEE Transactions on Haptics*, 7(3):311–323, July 2014.

I. M. Bullock, **T. Feix**, and A. M. Dollar. Dexterous Workspace of Human Two- and Three-Fingered Precision Manipulation. In *IEEE Haptics Symposium*, February 2014.

J. Romero, **T. Feix**, C. H. Ek, H. Kjellstrom, and D. Kragic. Extracting Postural Synergies for Robotic Grasping. *Robotics, IEEE Transactions on*, 29(6):1342–1352, December 2013.

I. M. Bullock, **T. Feix**, and A. M. Dollar. Finding small, versatile sets of human grasps to span common objects. In *IEEE International Conference on Robotics and Automation*, May 2013. **Best Manipulation Paper Award - Finalist.**

**T. Feix**, J. Romero, C. H. Ek, H.B. Schmiedmayer, and D. Kragic. A Metric for Comparing the Anthropomorphic Motion Capability of Artificial Hands. *IEEE Transactions on Robotics*, 29(1):82–93, February 2013.

J. Romero, **T. Feix**, H. Kjellström, and D. Kragic. Spatio-Temporal modeling of grasping actions. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, October 2010.

**T. Feix**, R. Pawlik, H.B. Schmiedmayer, J. Romero, and D. Kragic. A Comprehensive Grasp Taxonomy. In *Robotics, Science and Systems Conference: Workshop on Understanding the Human Hand for Advancing Robotic Manipulation, Poster Presentation*, June 2009.

**T. Feix**. *Anthropomorphic Hand Optimization based on a Latent Space Analysis*. Phd thesis, Vienna University of Technology, Vienna, Austria, October 2011.

**T. Feix**. Aufbau und Einsatz eines modularen Skipprüfstandes. Master thesis, University of Applied Sciences Technikum Wien, Vienna, Austria, May 2007.

Herzogenaurach, August 29, 2022

Dipl.Ing(FH) Dr.techn. Thomas Feix