

## Jingyi Xu

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RESEARCH INTERESTS	Grasping and manipulation of deformable objects <ul style="list-style-type: none"><li>• Contact modeling</li><li>• Grasp analysis, planning, and adaptation</li></ul> 3D perception, tactile-based object recognition
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EDUCATION	Technical University of Munich (TUM) <b>Ph.D. Candidate, Chair of Media Technology</b> Expected Aug. 2020 Advisor: Prof. Dr.-Ing. Eckehard Steinbach Research Focus: Grasping deformable objects with compliant gripper jaws <b>Master of Science (M.Sc.) with High Distinction, TUM</b> Jul. 2014 Electrical and Computer Engineering GPA: 1.2 (on a scale from 1 to 5, with 1 being the highest score) <b>Bachelor of Science (B.Sc.), TUM</b> Aug. 2012 Electrical and Computer Engineering
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RESEARCH EXPERIENCE	<b>Visiting Researcher, AUTOLab, UC Berkeley</b> Apr. 2019 - Oct. 2019 Advisor: Prof. Ken Goldberg Learning robust grasps for 3D deformable objects. <b>Ph.D. Candidate, TUM</b> Nov. 2014 - present Advisor: Prof. Dr.-Ing. Eckehard Steinbach. Grasp planning and contact modeling with deformable gripper jaws. Learning-based grasp robustness assessment. Contact simulation for deformable objects. <b>Master Thesis, TUM</b> Oct. 2013 - Jul. 2014 Topic: "Order Reduction of Pseudo-Boolean Functions for QPBO" Advisors: Dipl.-Ing. Roderick de Nijs and Univ. Prof. Dr.-Ing. Martin Buss. Algorithm development for order reduction and optimization of higher-order pseudo-boolean functions. Applied for image segmentation and image de-noising. <b>Graduate Research Assistant, TUM</b> Oct. 2012 - Apr. 2013 Algorithm development and implementation for semantic segmentation based on randomized decision forests and bag-of-words. <b>RoboHockey Tournament, TUM</b> Oct. 2012 - Jan. 2013 Robot Hockey Tournament with the Pioneer 3-AT mobile platforms. Attack and defense strategy design, PID controller, obstacle avoidance. <b>3D Data Analysis and Visualization for Robotics</b> Oct. 2012 - Jan. 2013 Supervisor: Prof. Dr. Gordon Cheng. Statistical analysis: PCA, ICA, LDA. 3D pose estimation and registration. Isolation of 3D objects. <b>RoboSoccer Tournament, TUM</b> Apr. 2012 - Sep. 2012 Multi-robot soccer tournament with the Pololu 3Pi robots. PID controller, defense strategy design. <b>Bachelor Thesis</b> Sep. 2011 - Dec. 2011 Topic: "An adaptive higher-order sliding mode controller for a cart-pendulum system." Advisor: Dr.-Ing. Marion Leibold. Development of the super-twisting algorithm to reduce high-frequency oscillation for a cart-pendulum system.
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## PUBLICATIONS

- [1] **J. Xu**, M. Danielczuk, J. Ichnowski, J. Mahler, E. Steinbach, K. Goldberg, "Minimal Work: A Grasp Quality Metric for Deformable Hollow Objects." *Submitted to IEEE International Conference on Robotics and Automation (ICRA)*, 2020.
- [2] **J. Xu**, M. Danielczuk, E. Steinbach, K. Goldberg, "Efficiently Planning Soft Non-Planar Area Contact Grasps using 6D Friction Cones." *Submitted to IEEE International Conference on Robotics and Automation (ICRA)*, 2020.
- [3] **J. Xu**, T. Aykut, D. Ma, E. Steinbach, "6DLS: Modeling Non-Planar Frictional Surface Contacts for Grasping using 6D Limit Surfaces." *IEEE Transactions on Robotics (TRO)*, under review, 2019.
- [4] M. Danielczuk, **J. Xu**, J. Mahler, M. Matl, N. Chentanez, K. Goldberg, "REACH: Reducing False Negatives in Robot Grasp Planning with a Robust Efficient Area Contact Hypothesis Model." *The International Symposium on Robotics Research (ISRR)*, 2019.
- [5] J. Ichnowski, M. Danielczuk, **J. Xu**, V. Satish, K. Goldberg, "GOMP: Grasp-Optimized Motion Planning for Bin-Picking." *Submitted to IEEE International Conf. on Robotics and Automation (ICRA)*, 2020.
- [6] T. Aykut, **J. Xu**, E. Steinbach. "Realtime 3D 360-Degree Telepresence With Deep-Learning-Based Head-Motion Prediction." *IEEE Journal on Emerging and Selected Topics in Circuits and Systems*, 2019.
- [7] **J. Xu**, A. Bhardwaj, G. Sun, T. Aykut, N. Alt, M. Karimi, E. Steinbach. "Learning-Based Modular Task-Oriented Grasp Stability Assessment." *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2018.
- [8] T. Aykut, C. Burgmair, M. Karimi, **J. Xu**, E. Steinbach. "Delay Compensation for Actuated Stereoscopic 360 Degree Telepresence Systems with Probabilistic Head Motion Prediction." *IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2018.
- [9] T. Aykut, C. Zou, **J. Xu**, D. Van Opdenbosch, E. Steinbach. "A Delay Compensation Approach for Pan-Tilt-Unit-based Stereoscopic 360° Telepresence Systems Using Head Motion Prediction." *IEEE International Conference on Robotics and Automation (ICRA)*, 2018.
- [10] **J. Xu**, N. Alt, Z. Zhang, E. Steinbach. "Grasping posture estimation for a two-finger parallel gripper with soft material jaws using a curved contact area friction model." *IEEE International Conference on Robotics and Automation (ICRA)*, 2017.
- [11] N. Alt, **J. Xu**, E. Steinbach. "A dataset of thin-walled deformable objects for manipulation planning." *Int. Workshop on Grasping and Manipulation Datasets, in conjunction with IEEE International Conference on Robotics and Automation (ICRA)*, 2016.
- [12] N. Alt, **J. Xu**, E. Steinbach. "Grasp planning for thin-walled deformable objects." *Int. Workshop on Robotic Hands, Grasping, and Manipulation, in conjunction with IEEE International Conference on Robotics and Automation (ICRA)*, 2015.

## SCHOLARSHIPS

**The Germany Scholarship (Deutschlandstipendium)**

Oct. 2013 - Sep. 2014

Scholarship for talented and outstanding students.  
Supported by the MAN Truck and Bus AG.

## INVITED TALKS

**Robotics: Science and Systems (RSS), Germany**

Jun. 2019

Invited by Dr. Amir Esfahani and Dr. Mohades Kasaei.  
Workshop: "Task-Informed Grasping: From Perception to Physical Interaction"  
Topic: "Deep learning for robust grasping of generic objects."

**Research Seminar, AUTOLab, UC Berkeley**

Apr. 2019

Invited by Prof. Ken Goldberg.  
Topic: "Grasping deformable objects with soft fingers."

**ICS Research Seminar, Institute for Cognitive Systems, TUM** Apr. 2017  
Invited by Prof. Dr. Gordon Cheng.  
Topic: "Grasping posture estimation for a parallel soft gripper using a curved contact area friction model."

**Doctoral Seminar, Chair of Media Technology, TUM** Jul. 2017  
Invited by Prof. Dr.-Ing. Eckehard Steinbach.  
Topic: "Grasping and manipulation of deformable objects."

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LEADERSHIP,  
MENTORING AND  
TEACHING

Technical University of Munich (TUM)  
**Computational Haptics Laboratory (C++)** Apr. 2015 - present  
Supervision of weekly programming tasks and term team projects.  
**Lab Course Android Programming** Oct. 2015 - present  
Android programming lectures . Supervision of term projects for App development.  
**RoboSoccer Tournament (C++)** Apr. 2012 - Sep. 2012  
Team leader. 2nd Prize of the RoboSoccer Tournament 2012.  
**Supervision of student projects** Jan. 2015 - present  
Theses supervision of 11 undergraduate and graduate students. Topics include:  
learning-based grasp detection, RGBD image processing, FEM simulations.

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OTHER  
ACTIVITIES

**Capstone Program, McKinsey, Germany** Dec. 2015 - present  
A program for outstanding students and PhD candidates.  
Training workshops for communication, problem solving, and project management.  
**Digital Shapers, McKinsey, SAP, Airbus etc., Germany.** Dec. 2017 - Apr. 2018  
A Challenge to solve real-life problems through digitalization  
Finalist (30 Finalists from 600+ Applicants)  
Challenge: How should SAP help customers address digital globalization problems?

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QUALIFICATIONS  
AND INTERESTS

**Programming:** Python, Matlab, C/C++, Java, ROS, OpenCV, PCL, Android, QT.  
**Software:** Linux, ANSYS, Nvidia FLEX, Mathematica, Autodesk Fusion, Git.  
**Languages:** Native Chinese, fluent written and spoken English and German.  
**Interests:** Robotics, piano, books and hiking.

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REFERENCES

**Prof. Dr.-Ing. Eckehard Steinbach**  
Chair of Media Technology, TUM.  
**Tel.:** +49 (89) 289-23504.  
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**Prof. Ken Goldberg**  
AUTOLab, UC Berkeley.  
**Tel.:** +1 (510) 643-9565  
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**Prof. Dr.-Ing. Wolfgang Kellerer**  
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