

Tasbolat Taunyazov

National University of Singapore
PhD Student

e-mail: tasbolat@comp.nus.edu.sg
webpage: tasbolat.com
github: [tasbolat1](https://github.com/tasbolat1)

RESEARCH INTERESTS

Robot manipulation, tactile sensing and multi-modal fusion.

EDUCATION

National University of Singapore
Ph.D. in Computer Science
Advisors: Dr.Yan Wu and Dr.Harold Soh

Aug 2018-Jan 2023 (expected)

Nazarbayev University
M.S. in Robotics

2015-2017

Advisor: Dr.Almas Shintemirov

Thesis: Intuitive Teleoperation of 6-DoF Universal Robots Manipulators in Constrained Workspace using Nonlinear Model Predictive Control

Nazarbayev University
B.S. in Robotics and Mechatronics

2011-2015

AWARDS

IROS Best Paper Award 2021

NUS Research Achievement Award 2020

A-STAR SINGA PhD Scholarship 2018-2023

PUBLICATIONS

Journal Articles

2020 Shintemirov A, **Taunyazov, T**, Omarali B, Nurbayeva A, Kim A, Bukeyev A and Rubagotti M. An open-source 7-DOF wireless human arm motion-tracking system for use in robotics research. *Sensors*, 20(11):3082.

2019 Rubagotti M, **Taunyazov T**, Omarali B and Shintemirov A. Semi-autonomous robot teleoperation with obstacle avoidance via model predictive control. *IEEE Robotics and Automation Letters (RA-L)*, 4(3):2746-53.

2017 **Taunyazov T**, Rubagotti M and Shintemirov A. Constrained Orientation Control of a Spherical Parallel Manipulator via Online Convex Optimization. *IEEE/ASME Transactions on Mechatronics*, 23(1):252-61.

Conference Papers

- 2021 **Taunyazov T**, Song LS, Lim E, See HH, Lee D, Tee BC, Soh H. Extended Tactile Perception: Vibration Sensing through Tools and Grasped Objects. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. [**Best Paper Award**]
- 2020 Gao R, **Taunyazov T**, Lin Z, Wu Y. Supervised autoencoder joint learning on heterogeneous tactile sensory data: Improving material classification performance. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*.
- 2020 **Taunyazov T**, Sng W, See HH, Lim B, Kuan J, Ansari AF, Tee BC, Soh H. Event-driven visual-tactile sensing and learning for robots. In *Robotics: Science and Systems (RSS)*.
- 2020 **Taunyazov T**, Chua Y, Gao R, Soh H, Wu Y. Fast texture classification using tactile neural coding and spiking neural network. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*.
- 2019 **Taunyazov T**, Koh HF, Wu Y, Cai C, Soh H. Towards effective tactile identification of textures using a hybrid touch approach. In *International Conference on Robotics and Automation (ICRA)*.
- 2017 Omarali B, **Taunyazov T**, Bukeyev A, Shintemirov A. Real-time predictive control of an ur5 robotic arm through human upper limb motion tracking. In *Proceedings of the Companion of the 2017 ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. [**Late-breaking Report**]
- 2016 **Taunyazov T**, Omarali B, Shintemirov A. A novel low-cost 4-DOF wireless human arm motion tracker. In *IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob)*.
- 2015 Omarali B, **Taunyazov T**, Nyetkaliyev A, Shintemirov A. System integration of a solar sensor and a spherical parallel manipulator for a 3-axis solar tracker platform design. In *IEEE/SICE International Symposium on System Integration (SII)*.

TEACHING EXPERIENCE

Mentorship at A*STAR

Ruihan Gao (now PhD at CMU) 2019-2020

Teaching Assistant at Nazarbayev University

ROBT-407: Statistical Methods and Machine Learning Fall 2016

ROBT-402: Robotic/Mechatronic System Design Spring 2017

SERVICE

Conference Reviewer

IROS 2020-2022, ICRA 2020-2022, IJCAI 2019.

Journal Reviewer

Frontiers in Robotics and AI 2022, RA-L 2021-2022, TMECH 2020.

SKILLS

Robotics

Robotic Frameworks: ROS, YARP.

Open chain robots: UR5/10, KUKA LBR IIWA 7, Franka Emika Panda, iCub, Kuka YouBot.

Closed chain robots: Spherical Parallel Manipulator (SPM).

Artificial Intelligence

Generic ML frameworks: Pytorch, Tensorflow.

Event-based ML frameworks: Nengo, SLAYER.

Control: Non-linear Model Predictive Control, Convex Optimization.

REFERENCES

Yan Wu, Senior Scientist & Deputy Head

Robotics & Autonomous Systems, A*STAR Institute for Infocomm Research, Singapore
wuy@i2r.a-star.edu.sg

Harold Soh, Assistant Professor

School of Computing, National University of Singapore, Singapore
harold@comp.nus.edu.sg

Almas Shintemirov, Associate Professor

Department of Robotics, Nazarbayev University, Nur-Sultan (Astana)
ashintemirov@nu.edu.kz

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