TAKUMA YONEDA

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EDUCATION

Toyota Technological Institute at Chicago (TTIC), Chicago, IL
PhD candidate in Computer Science, 2018 - present
Toyota Technological Institute (TTI), Aichi, Japan
Bachelor of Engineering, 2014 - 2018
(graduated at the top of the class)

RESEARCH INTEREST

Reinforcement Learning, Diffusion Models, Robotics, Large Language Models, Natural Language Processing and Deep Learning.

PUBLICATIONS (GOOGLE SCHOLAR)

Statler: State-Maintaining Language Models for Embodied Reasoning
Takuma Yoneda*, Jiading Fang*, Peng Li*, Huanyu Zhang, Tianchong Jiang, Ben Picker, David Yunis, Shengjie Lin, Luzhe Sun, Richard Xu, Hongyuan Mei and Matthew Walter
In submission

Blending Imitation and Reinforcement Learning for Robust Policy Improvement
Xuefeng Liu, Takuma Yoneda, Matthew Walter, Yuxin Chen and Rick L. Stevens
In submission

6-DoF Stability Field via Diffusion Models
Takuma Yoneda*, Tianchong Jiang*, Gregory Shakhnarovich and Matthew R. Walter
In submission

Cold Diffusion on the Replay Buffer: Learning to Plan from Known Good States
Zidan Wang, Takuma Yoneda, Takeru Oba, Rui Shen, Matthew Walter and Bradly C. Stadie
To appear at Conference on Robot Learning (CoRL) 2023
Available at: https://arxiv.org/pdf/2310.13914.pdf

Active Policy Improvement from Multiple Black-box Oracles
Xuefeng Liu*, Takuma Yoneda*, Chaoqi Wang*, Matthew Walter and Yuxin Chen
In Proceedings of International Conference on Machine Learning (ICML) 2023
Available at: https://proceedings.mlr.press/v202/liu23av/liu23av.pdf

To the Noise and Back: Diffusion for Shared Autonomy
Takuma Yoneda, Luzhe Sun, Ge Yang, Bradly Stadie and Matthew R. Walter
In Proceedings of Robotics: Science and Systems (RSS) 2023
Available at: https://arxiv.org/abs/2302.12244

Invariance Through Latent Alignment
Takuma Yoneda*, Ge Yang*, Matthew R. Walter, and Bradly Stadie
In Proceedings of Robotics: Science and Systems (RSS) 2022
Available at: https://arxiv.org/pdf/2112.08526

A Robot Cluster for Reproducible Research in Dexterous Manipulation
Felix Widmaier*, Manuel Wüthrich*, Stefan Bauer, Niklas Funk, Julen Urain De Jesus, Jan Peters, Joe Watson, Claire Chen, Krishnan Srinivasan, Junwu Zhang, Jeffrey Zhang, Matthew R Walter, Rishabh Madan, Charles Schaff, Takahiro Maeda, <u>Takuma Yoneda</u>, Denis Yarats, Arthur Allshire, Ethan K Gordon, Tapomayukh Bhattacharjee, Siddhartha S Srinivasa, Animesh Garg, Annika Buchholz, Sebastian Stark, Thomas Steinbrenner, Joel Akpo, Shruti Joshi, Vaibhav Agrawal, Bernhard Schölkopf
arXiv:2109.10957 2021
Available at: https://arxiv.org/pdf/2109.10957

Benchmarking Structured Policies and Policy Optimization for Real-World Dexterous Object Manipulation
<u>Takuma Yoneda</u>*, Niklas Funk*, Charles Schaff*, Rishabh Madan*, Julen Urain De Jesus, Joe Watson, Ethan K Gordon, Felix Widmaier, Stefan Bauer, Siddhartha S Srinivasa, Tapomayukh Bhattacharjee, Matthew R. Walter, and Jan Peters
In Special Issue: Robotic Grasping and Manipulation Challenges and Progress, IEEE Robotics and Automation Letters.
Available at: https://arxiv.org/pdf/2105.02087

Grasp and motion planning for dexterous manipulation for the real robot challenge
<u>Takuma Yoneda</u>*, Charles Schaff*, Takahiro Maeda, and Matthew R. Walter
arXiv:2101.02842 2020
Available at: https://arxiv.org/pdf/2101.02842

Pow-Wow: A Dataset and Study on Collaborative Communication in Pommerman
<u>Takuma Yoneda</u>, Matthew Walter and Jason Naradowsky
In the First Workshop on Language in Reinforcement Learning (LaReL), ICML 2020.
Available at: https://arxiv.org/pdf/2009.05940

UCL Machine Reading Group: Four Factor Framework For Fact Finding (HexaF)
<u>Takuma Yoneda</u>, Jeff Mitchell, Johannes Welbl, Pontus Stenetorp and Sebastian Riedel
In Proceedings of the First Workshop on Fact Extraction and VERification (FEVER), EMNLP 2018, Brussels, Belgium, 2018.
Available at: http://www.aclweb.org/anthology/W18-5515.pdf

Bib2vec: Embedding-based Search System for Bibliographic Information
<u>Takuma Yoneda</u>, Koki Mori, Makoto Miwa and Yutaka Sasaki
In Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics, EACL 2017, Valencia, Spain, 2017.
Available at: https://aclanthology.org/E17-3028.pdf

INTERNSHIPS

Preferred Networks, Inc.   Summer 2019
Tokyo, Japan

Research on multi-agent collaboration with Deep Reinforcement Learning.

University College London   Summer 2018
London, U.K.

Research and development of a natural language based information retrieval and fact-checking system. We won 2nd place in FEVER (Fact Extraction and VERification) competition with our system.

VASILY, Inc. (acquired by ZOZO Technologies, Inc.)   Summer 2017
Tokyo, Japan

Research and development on learning multi-modal latent space for fashion items and their natural language descriptions.

Yamaha Motor Co., Ltd. Spring 2017
Shizuoka, Japan

Developing a light-weight vehicle recognition system for motorcycles.

Toyota Motor Corporation Spring 2015
Aichi, Japan

Learning Toyota Production System (TPS) and how the system improves efficiencies of manufacturing.

ACHIEVEMENTS

Real Robot Challenge; 1st place (out of 5 teams) November 2020

We worked on an object manipulation task wherein a robot attempts to grasp and orient a rectangular object to target pose. This task was surprisingly hard, with existing RL algorithms failing because of the high degrees of freedom present in the system. We implemented a planning-based controller and trained a second residual policy on top of the planner, allowing us to use RL and planning in one loop. To demonstrate the sim-to-real capabilities of our method, we also transferred the learned policy from a simulated Tri-finger robot to a real robot. This sim-to-real approach worked very well, and lead to our team (TTIC) obtaining 1st place in a real-world object manipulation competition: Real Robot Challenge hosted by Max Planck Institute. Winning the challenge, we are granted a cash prize of 12,500 EUR.

Fact-extraction and Verification shared task; 2nd place (out of ~ 25 teams) August 2018

In this NLP research, we considered the timely problem of combating fake-news. During my internship at University College London, I led a project under Prof. Sebastian Riedel, to develop a method that automatically verifies if a given sentence is factually correct. This algorithm was also able to explain the reasoning behind its decisions by extracting relevant quotes from Wikipedia. With our approach, we participated in the fact-extraction and verification shared task competition. Our score obtained second place.