

Nicklas Hansen

📞 +1 (619) 375-9792 | ✉️ hello@nicklashansen.com | 🏠 nicklashansen.com | 🌐 [nicklashansen](https://nicklashansen.com) | 🐦 [@ncklashansen](https://twitter.com/ncklashansen) | 🔗 [ncklas](https://www.linkedin.com/in/ncklas) | 📍 San Diego, CA

Research Interest

I am broadly interested in developing intelligent agents that continuously learn, generalize, and adapt. My work is at the intersection of **reinforcement learning**, **robotics**, and **computer vision**.

Education

University of California, San Diego

PhD student, Computer Science and Engineering, GPA: 3.85/4.0

· Advised by Xiaolong Wang and Hao Su.

San Diego, CA, USA

Fall 2021 - present

University of California, Berkeley

Visiting Student, GPA: 4.0/4.0

· Spar Nord Fonden's FinTech scholarship recipient, SCET's Collider Cup finalist.

Berkeley, CA, USA

Spring 2020

Technical University of Denmark

MSc Mathematical Modeling & Computation, GPA: 11.2/12.0

· Special topics in machine learning. Advised by Ole Winther.

Kongens Lyngby, Denmark

Feb 2019 - Jan 2021

Technical University of Denmark

BSc Software Technology, GPA: 8.2/12.0, final year GPA: 10.8/12.0

· **Nanyang Technological University, Singapore** - semester abroad, Fall 2017.

Kongens Lyngby, Denmark

Sep 2015 - Dec 2018

Publications & Preprints (17)

TD-MPC2: Scalable, Robust World Models for Continuous Control

International Conference on Learning Representations (ICLR)

Nicklas Hansen, Hao Su*, Xiaolong Wang*

<https://arxiv.org/abs/2310.16828>

Spotlight

2024

Open X-Embodiment: Robotic Learning Datasets and RT-X Models

International Conference on Robotics and Automation (ICRA)

Open X-Embodiment Collaboration, [...], Nicklas Hansen, [...] (173 authors)

<https://arxiv.org/abs/2310.08864>

Poster

2024

MoDem-V2: Visuo-Motor World Models for Real-World Robot Learning

International Conference on Robotics and Automation (ICRA)

Patrick Lancaster, Nicklas Hansen, Aravind Rajeswaran, Vikash Kumar

<https://arxiv.org/abs/2309.14236>

Poster

2024

Finetuning Offline World Models in the Real World

Conference on Robot Learning (CoRL)

Yunhai Feng*, Nicklas Hansen*, Ziyang Xiong*, Chandramouli Rajagopalan, Xiaolong Wang

<https://arxiv.org/abs/2310.16029>

Oral

2023

Multi-Task Real Robot Learning with Generalizable Neural Feature Fields

Conference on Robot Learning (CoRL)

Yanjie Ze, Ge Yan, Yueh-Hua Wu, Annabella Macaluso, Yuying Ge, Jianglong Ye, Nicklas Hansen, Li Erran Li, Xiaolong Wang

<https://arxiv.org/abs/2308.16891>

Oral

2023

On Pre-Training for Visuo-Motor Control: Revisiting a Learning-from-Scratch Baseline

International Conference on Machine Learning (ICML)

Poster

2023

Nicklas Hansen*, Zhechen Yuan*, Yanjie Ze*, Tongzhou Mu*, Aravind Rajeswaran[^], Hao Su[^], Huazhe Xu[^], Xiaolong Wang[^]

<https://arxiv.org/abs/2212.05749>

MoDem: Accelerating Visual Model-Based Manipulation with Demonstrations

International Conference on Learning Representations (ICLR)

Poster

2023

Nicklas Hansen, Yixin Lin, Hao Su, Xiaolong Wang, Vikash Kumar, Aravind Rajeswaran

<https://arxiv.org/abs/2212.05698>

On the Feasibility of Cross-Task Transfer with Model-Based Reinforcement Learning

International Conference on Learning Representations (ICLR)

Poster

2023

Yifan Xu*, **Nicklas Hansen***, Zirui Wang, Yung-Chieh Chan, Hao Su, Zhouwen Tu

<https://arxiv.org/abs/2210.10763>

Visual Reinforcement Learning with Self-Supervised 3D Representations

IEEE Robotics and Automation Letters (RA-L)

Journal & Poster

2023

International Conference on Intelligent Robots and Systems (IROS)

Yanjie Ze*, **Nicklas Hansen***, Yinbo Chen, Mohit Jain, Xiaolong Wang

<https://arxiv.org/abs/2210.07241>

Graph Inverse Reinforcement Learning from Diverse Videos

Conference on Robot Learning (CoRL)

Oral

2022

Sateesh Kumar, Jonathan Zamora*, **Nicklas Hansen***, Rishabh Jangir, Xiaolong Wang

<https://arxiv.org/abs/2207.14299>

Temporal Difference Learning for Model Predictive Control

International Conference on Machine Learning (ICML)

Short Presentation

2022

Nicklas Hansen, Xiaolong Wang*, Hao Su*

<https://arxiv.org/abs/2203.04955>

Look Closer: Bridging Egocentric and Third-Person Views with Transformers for Robotic Manipulation

IEEE Robotics and Automation Letters (RA-L)

Journal & Poster

International Conference on Robotics and Automation (ICRA)

2022

Rishabh Jangir*, **Nicklas Hansen***, Sambaran Ghosal, Mohit Jain, Xiaolong Wang

<https://arxiv.org/abs/2201.07779>

Learning Vision-Guided Quadrupedal Locomotion with Cross-Modal Transformers

International Conference on Learning Representations (ICLR)

Spotlight

2022

Ruihan Yang*, Minghao Zhang*, **Nicklas Hansen**, Huazhe Xu, Xiaolong Wang

<https://arxiv.org/abs/2107.03996>

Stabilizing Deep Q-Learning with ConvNets and Vision Transformers under Data Augmentation

Conference on Neural Information Processing Systems (NeurIPS)

Poster

2021

Nicklas Hansen, Hao Su, Xiaolong Wang

<https://arxiv.org/abs/2107.00644>

Generalization in Reinforcement Learning by Soft Data Augmentation

International Conference on Robotics and Automation (ICRA)

Poster

2021

Nicklas Hansen, Xiaolong Wang

<https://arxiv.org/abs/2011.13389>

Self-Supervised Policy Adaptation during Deployment

International Conference on Learning Representations (ICLR)

Spotlight

2021

Nicklas Hansen, Rishabh Jangir, Yu Sun, Guillem Alenyà, Pieter Abbeel, Alexei A. Efros, Lerrel Pinto, Xiaolong Wang

<https://arxiv.org/abs/2007.04309>

Short Term Blood Glucose Prediction Based on Continuous Glucose Monitoring Data IEEE Engineering in Medicine and Biology Conference (EMBC)

Ali Mohebbi, Alexander R. Johansen, **Nicklas Hansen**, Peter E. Christensen, Jens M. Tarp,
Morten L. Jensen, Henrik Bengtsson, Morten Mørup
<https://arxiv.org/abs/2002.02805>

Poster
2020

Teaching

Technical University of Denmark

Reinforcement Learning

Co-organizer

Jan 2021

· Special course that I co-organized w/ Prof. Ole Winther for a group of students. Three weeks of full-time study.

Technical University of Denmark

02456 Deep Learning

Teaching Assistant

Fall 2019, Fall 2020

· Significant course material contributions, **supervised 100+ students' projects** on reinforcement learning.

02454 Introduction to Cognitive Science

Fall 2019

· Assisted tutorial sessions, corrected assignments.

Current and Former Mentees

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| Rishabh Jangir (MS, UCSD -> Robotics Engineer, Nimble) | 2020 - 2022 |
| Mohit Jain (MS, UCSD -> ML Engineer, Pinterest) | 2020 - 2022 |
| Xinyue Chen (BS, NYU Shanghai -> PhD, UC Berkeley) | 2021 - 2022 |
| Sateesh Kumar (MS, UCSD -> Research Engineer, ByteDance) | 2021 - 2023 |
| Jonathan Zamora-Anaya (BS, UCSD -> MS, USC) | 2021 - 2023 |
| Sambaran Ghosal (MS, UCSD) | 2021 - 2023 |
| Zirui "Colin" Wang (BS, UCSD -> PhD, Cornell) | 2022 - 2023 |
| Ziyan Xiong (BS, Tsinghua University) | 2022 - 2023 |
| Yanjie Ze (BS, SJTU) | 2021 - 2023 |
| Yunhai Feng (MS, UCSD) | 2022 - |
| Chandramouli Rajagopalan (MS, UCSD) | 2022 - |

Invited Talks

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|-----------------------|--|----------------|
| Univ. Michigan | "Robot Learning with (Generalist) World Models" | Jan 2024 |
| Georgia Tech | "Building Generalist World Models" | Jan 2024 |
| Tech. Univ. Denmark | "Data-Driven World Models at Scale: Why, What, and How?" | Dec 2023 |
| Tsinghua IIIS | "The Next Generation of World Models" | Mar 2023 |
| MILA/ServiceNow | "World Models with Behavioral Priors" | Feb 2023 |
| Georgia Tech | "Towards Sample-Efficient Robot Learning with World Models" | Jan 2023 |
| Meta AI (FAIR) | "Pretraining for Control: Current Challenges and Solutions" | Jan 2023 |
| TU Delft | "Model-Based Reinforcement Learning: A Path Towards Generalist Agents?" | Oct 2022 |
| UCSD RoboGrads | "Model-Based Reinforcement Learning: A Path Towards Generalist Agents?" | Oct 2022 |
| Generally Intelligent | Podcast: https://generallyintelligent.com/podcast/2022-12-16-podcast-episode-25-nicklas-hansen/ | September 2022 |
| Intel AI | "Temporal Difference Learning for Model Predictive Control" | April 2022 |
| Intel AI | "Robots that Generalize" | August 2021 |
| G-Research | "Agents that Generalize and Adapt" | February 2021 |
| Neural AI | "An Introduction to Reinforcement Learning" | June 2019 |

Academic Service

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|------|---|----------|
| 2024 | European Conference on Computer Vision (ECCV) | Reviewer |
| 2024 | International Conference on Machine Learning (ICML) | Reviewer |
| 2024 | Conference on Computer Vision and Pattern Recognition (CVPR) | Reviewer |
| 2024 | International Conference on Learning Representations (ICLR) | Reviewer |
| 2024 | IEEE International Conference on Robotics & Automation (ICRA) | Reviewer |
| 2023 | Foundation Models for Decision-Making, Workshop @ NeurIPS | Reviewer |

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| 2023 | Self-Supervised Learning - Theory and Practice, Workshop @ NeurIPS | Reviewer |
| 2023 | Journal of Machine Learning Research (JMLR) | Reviewer |
| 2023 | International Journal of Computer Vision (IJCV) | Reviewer |
| 2023 | Conference on Neural Information Processing Systems (NeurIPS) | Top Reviewer |
| 2023 | Learning Dexterous Manipulation, Workshop @ RSS | Reviewer |
| 2023 | International Conference on Computer Vision (ICCV) | Reviewer |
| 2023 | Structural and Compositional Learning on 3D data, Workshop @ CVPR | Reviewer |
| 2023 | IEEE Robotics and Automation Letters (RA-L) | Reviewer |
| 2023 | International Conference on Intelligent Robots and Systems (IROS) | Reviewer |
| 2023 | International Conference on Machine Learning (ICML) | Reviewer |
| 2023 | Conference on Computer Vision and Pattern Recognition (CVPR) | Reviewer |
| 2023 | International Conference on Representation Learning (ICLR) | Assisted review |
| 2023 | IEEE International Conference on Robotics & Automation (ICRA) | Reviewer |
| 2022 | Self-Supervised Learning - Theory and Practice, Workshop @ NeurIPS | Reviewer |
| 2022 | Conference on Neural Information Processing Systems (NeurIPS) | Reviewer |
| 2022 | European Conference on Computer Vision (ECCV) | Reviewer |
| 2022 | IEEE Robotics and Automation Letters (RA-L) | Reviewer |
| 2022 | Generalizable Policy Learning in the Physical World, Workshop @ ICLR | Reviewer |
| 2022 | International Conference on Machine Learning (ICML) | Reviewer |
| 2022 | Conference on Computer Vision and Pattern Recognition (CVPR) | Reviewer |
| 2022 | IEEE Robotics and Automation Letters (RA-L) | Reviewer |
| 2021 | Association for the Advancement of Artificial Intelligence (AAAI) | Reviewer |
| 2021 | International Conference on Machine Learning (ICML) | Assisted review |
| 2020 | Annual Conference of the Association for Computational Linguistics (ACL) | Assisted review |
| 2020 | SIGNLL Conference on Computational Natural Language Learning (CoNLL) | Assisted review |

Workshop Presentations

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| TD-MPC2: Scalable, Robust World Models for Continuous Control | Poster |
| Foundation Models for Decision-Making @ NeurIPS | 2023 |
| Robot Learning @ NeurIPS | 2023 |
| Pre-Training Robot Learning @ CoRL | 2023 |
| On Pre-Training for Visuo-Motor Control: Revisiting a Learning-from-Scratch Baseline | Poster |
| Pre-Training Robot Learning @ CoRL | 2022 |
| On the Feasibility of Cross-Task Transfer with Model-Based Reinforcement Learning | Poster |
| Pre-Training Robot Learning @ CoRL | 2022 |
| Foundation Models for Decision Making @ NeurIPS | 2022 |
| Deep RL Workshop @ NeurIPS | 2022 |
| MoDem: Accelerating Visual Model-Based Reinforcement Learning with Demonstrations | Poster |
| Pre-Training Robot Learning @ CoRL | 2022 |
| Deep RL Workshop @ NeurIPS | 2022 |
| Look Closer: Bridging Egocentric and Third-Person Views with Transformers for Robotic Manipulation | Poster |
| Workshop on Deployable Decision Making in Embodied Systems @ NeurIPS | 2021 |
| Deep RL Workshop @ NeurIPS | 2021 |
| Learning Vision-Guided Quadrupedal Locomotion End-to-End with Cross-Modal Transformers | Poster |
| Deep RL Workshop @ NeurIPS | 2021 |
| Visual Learning and Reasoning for Robotics Workshop @ RSS | 2021 |
| Stabilizing Deep Q-Learning with ConvNets and Vision Transformers under Data Augmentation | Poster |
| Unsupervised RL Workshop @ ICML | 2021 |
| Visual Learning and Reasoning for Robotics Workshop @ RSS | 2021 |

Self-Supervised Policy Adaptation During Deployment

Microsoft Research RL Day

Deep RL Workshop @ NeurIPS

Workshop on Robot Learning @ NeurIPS

Poster

2021

2020

2020

Work Experience

Meta AI (FAIR)

Student Researcher

· Model-Based Reinforcement Learning. Mentored by Aravind Rajeswaran.

Menlo Park, CA, USA

June 2022 - Dec 2022

raffle.ai

Machine Learning Intern

· I built and open-sourced a cross-domain text-to-SQL parser in PyTorch.

Copenhagen, Denmark

Summer 2019

Retune DSP

Student Assistant

· I helped a team of engineers build and maintain deep learning pipelines for embedded voice control.

Kongens Lyngby, Denmark

Feb 2019 - Dec 2019

Nordic Transition

Student Software Developer

· I developed and maintained a data management and analysis platform for the HR industry.

Gentofte, Denmark

July 2016 - Dec 2019

Awards and Scholarships

2023 NVIDIA Graduate Fellowship 2024-25

· An award of \$60,000 to cover stipend and tuition for 1 year (10 recipients worldwide).

Fellowship

2021 Robotics Summer School Scholarship

· A scholarship to participate in a two-week summer program in Denmark.

Scholarship

2020 Spar Nord Fond Scholarship

· A scholarship to study a semester at UC Berkeley (5 recipients nation-wide).

Scholarship

2020 UC Berkeley's SCET Collider Cup Finalist

· Biannual startup competition. Best student project from each class is nominated.

Award

2020 Innovation Center Denmark's SPARK Winner

· Best project in a 6-month entrepreneurial program in the Bay Area.

Award

2017 Otto Mønsted Fonds Legat

· A grant for students with a GPA ≥ 8.0 who wish to study a semester abroad.

Scholarship

Volunteering

2023 UC San Diego GradAMP Mentor (PhD Applications)

2022 · Supported prospective students through weekly mentor-mentee meetings in Fall.

Mentorship

Misc. Open-Source Projects

TD-MPC2 Official Implementation (★141)

· Public code release for "TD-MPC2: Scalable, Robust World Models for Continuous Control".

<https://github.com/nicklashansen/tdmpc2>

2023

MoDem Official Implementation (★78)

· Public code release for "MoDem: Accelerating Visual Model-Based Manipulation with Demonstrations".

<https://github.com/facebookresearch/modem>

2022

TD-MPC Official Implementation (★244)

· Public code release for "Temporal Difference Learning for Model Predictive Control".

<https://github.com/nicklashansen/tdmpc>

2022

DMControl Generalization Benchmark (★143)

2020

· Benchmark for generalization in continuous control from pixels.
<https://github.com/nicklashansen/dmcontrol-generalization-benchmark>

PAD Official Implementation (★110)

2020

· Public code release for “Policy Adaptation During Deployment”.
<https://github.com/nicklashansen/policy-adaptation-during-deployment>

Voice Activity Detection in Noisy Environments (★176)

2019

· Code for training and running a neural Voice Activity Detector (VAD) in PyTorch.
<https://github.com/nicklashansen/voice-activity-detection>

How to build RNNs and LSTMs from scratch with NumPy (★228)

2019

· Educational material on recurrent neural networks.
https://github.com/nicklashansen/rnn_lstm_from_scratch

Jan 2024