Yash Chandak

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Education

2022–Current **Postdoctoral Scholar**, *Stanford University, USA*
Advised by Prof. Emma Brunskill

2017–2022 **PhD, Computer Science**, *University of Massachusetts Amherst, USA*
Advised by Prof. Philip S. Thomas, Autonomous Learning Lab.

2017–2020 **MS in Computer Science**, *University of Massachusetts Amherst, USA*
Advised by Prof. Philip S. Thomas, Autonomous Learning Lab.

2013–2017 **B.Tech, Computer Science & Engineering**, *VIT University, Chennai, India*
Advised by Prof. Nithya Darisini P.S.

Awards & Honors

2022 Google Ph.D. Fellowship. (Declined)
2022 *RLDM:* Best Paper.
2021 Outstanding Reviewer for NeurIPS (8%) and Top Reviewer for ICML (10%).
2020 *AAAI: Outstanding student paper honorable mention.*
2020 Graduated with Distinction, MS in Computer Science.
2013 Played at the national level for the Basketball Federation of India (BFI).

Internships

May-Sept '22 **Google DeepMind, London**, *under Diana Borsa, Will Dabney, and Prof. Remi Munos*
Jun-Aug '19 **Adobe Research, San Jose**, *under Georgios Theocharous and Prof. Sridhar Mahadevan*
Jun-Aug '18 **Adobe Research, San Jose**, *under Georgios Theocharous*
Jan–Jun '17 **Indian Institute of Technology Madras, India**, *under Prof. Balaraman Ravindran*
Jun–Jul '16 **University of Technology Troyes, France**, *under Prof. Babiga Birregah*
Feb–Mar '16 **Defence Research & Development Organisation (IRDE, DRDO)**, *under Sh. Jai Prakash Singh*
Feb–May '15 **The Aspiring Researcher Challenge**, *under Prof. James Davis, UCSC and Rajan Vaish, Stanford*

Teaching

Fall '20 Teaching Assistant for CS 687: Reinforcement Learning, UMass.
Fall '19 Guest Lecture *On Designing Reward Signals*, CS 687: Reinforcement Learning, UMass.
Spring '18 Teaching Assistant for CS 240: Reasoning Under Uncertainty, UMass.
Fall '17 Teaching Assistant for CS 383: Artificial Intelligence, UMass.

Service

Reviewer Journals: JMLR (2021-24), MLJ (2022-23), AIJ(2023).
Conferences: ICML (2019-23), NeurIPS (2019-2023), ICLR (2022-24), TMLR (2022-23), CoLLAs (2022-23).

Outreach and Mentorship

Fall '20 - Spring '21 PhD mentor, in collaboration with Microsoft New England, for CS696DS.
Guided 3 Master's students for the project on optimizing interventions in shared autonomy.

Spring '20 PhD mentor, in collaboration with Microsoft New England, for CS696DS.

Guided 4 Master's students towards developing human-agent cooperative RL systems.

Spring '19 PhD mentor, in collaboration with Microsoft Research Montreal, for CS696DS.
Guided 4 Master's students towards developing RL algorithms for text-based games.

Invited Talks

2023 Stanford Causal Inference Seminar
Topic: Adaptive Instrument Design for Indirect Experiments.

2022 Safe Reinforcement Learning workshop at IJCAI.
Topic: Going Beyond Expected Cost/Return Metrics and Stationarity Assumptions.

2022 University of New Hampshire
Topic: Reinforcement Learning for Non-stationary Environments.

Preprints

In Preparation **Information Directed Search for Formal Reasoning with Large Language Models**
Yash Chandak, Jonathan Lee, Emma Brunskill

In Preparation **OPERA: Offline Policy Evaluation with Re-weighted Aggregates of Multiple Estimators**
Allen Nie, **Yash Chandak**, Christina J. Yuan, Anirudhan Badrinath, Yannis Flet-Berliac, Emma Brunskill

Under Review **Data-Efficient Policy Evaluation Through Behavior Policy Search**
Josiah P. Hanna, **Yash Chandak**, Philip S. Thomas, Martha White, Peter Stone, Scott Niekum

Conference Publications

ICLR 2024 **Adaptive Instrument Design for Indirect Experiments**
Yash Chandak, Shiv Shankar, Vasilis Syrgkanis, Emma Brunskill
International Conference on Learning Representations

AISTATS 2024 **A/B testing under Interference with Partial Network Information**
Shiv Shankar, Ritwik Sinha, **Yash Chandak**, Saayan Mitra, Madalina Fiterau
International Conference on Artificial Intelligence and Statistics.

LAK 2024 **Estimating the Causal Treatment Effect of Unproductive Persistence**
Amelia Leon, Allen Nie, **Yash Chandak**, Emma Brunskill
International Conference on Learning Analytics and Knowledge.

NeurIPS 2023 **Behavior Alignment via Reward Function Optimization**
Dhawal Gupta*, **Yash Chandak***, Scott M. Jordan, Philip S. Thomas, Bruno Castro da Silva
Neural Information Processing Systems. *Equal contribution.

NeurIPS 2023 **In-Context Decision-Making from Supervised Pretraining**
Jonathan Lee, Annie Xie, Aldo Pacchiano, **Yash Chandak**, Chelsea Finn, Ofir Nachum, Emma Brunskill
Neural Information Processing Systems.

ICML 2023 **Representations and Exploration for Deep Reinforcement Learning using Singular Value Decomposition**
Yash Chandak, Shantanu Thakoor, Zhaohan Daniel Guo, Yunhao Tang, Remi Munos, Will Dabney, Diana Borsa
International Conference on Machine Learning

ICML 2023 **Understanding Self-Predictive Learning for Reinforcement Learning**
Yunhao Tang, Zhaohan Daniel Guo, Pierre Harvey Richemond , Bernardo Avila Pires, **Yash Chandak**, Remi Munos, Mark Rowland, Mohammad Gheshlaghi Azar, Charline Le Lan, Clare Lyle, Andras Gyorgy, Shantanu Thakoor, Will Dabney, Bilal Piot, Daniele Calandriello, Michal Valko

International Conference on Machine Learning

AISTATS **SSOPE: Asymptotically Unbiased Off-Policy Policy Evaluation when Reusing Old Data in Nonstationary Environments**
2023 Vincent Liu, **Yash Chandak**, Philip S. Thomas, Martha White
International Conference on Artificial Intelligence and Statistics

NeurIPS **(Off) Policy Evaluation for Action-Dependent Non-stationary Environments**
2022 **Yash Chandak**, Shiv Shankar, Nate Bastian, Bruno Castro da Silva,
Emma Brunskill, Philip S. Thomas
Neural Information Processing Systems.

NeurIPS **Factored DRO: Factored Distributionally Robust Policies for Contextual Bandits**
2022 Tong Mu, **Yash Chandak**, Tatsunori Hashimoto, Emma Brunskill
Neural Information Processing Systems.

AAAI **On Optimizing Interventions in Shared Autonomy**
2022 Weihao Tan*, David Koleczek*, Siddhant Pradhan*, Nicholas Perello, Vivek Chettiar, Nan Ma, Aaslesha Rajaram, Vishal Rohra, Soundararajan Srinivasan, H M Sajjad Hossain†, **Yash Chandak**†
Association for the Advancement of Artificial Intelligence. *Equal contribution, †Equal advising.

NeurIPS **Universal Off-Policy Evaluation**
2021 **Yash Chandak**, Scott Niekum, Bruno Castro da Silva, Erik Learned-Miller,
Emma Brunskill, Philip S. Thomas
Neural Information Processing Systems.

NeurIPS **SOPE: Spectrum of Off-Policy Estimators**
2021 Christina Yuan, **Yash Chandak**, Stephen Giguere, Philip S. Thomas, Scott Niekum
Neural Information Processing Systems.

ICML **High Confidence Generalization for Reinforcement Learning**
2021 James Kostas, **Yash Chandak**, Scott Jordan, Philip S. Thomas
International Conference on Machine Learning.

AAAI **High-Confidence Off-Policy (or Counterfactual) Variance Estimation**
2021 **Yash Chandak**, Shiv Shankar, Philip S. Thomas
Association for the Advancement of Artificial Intelligence.

NeurIPS **Towards Safe Policy Improvement for Non-Stationary MDPs**
2020 **Yash Chandak**, Scott Jordan, Georgios Theocharous, Martha White, Philip S. Thomas
Neural Information Processing Systems.

ICML **Optimizing for the Future in Non-Stationary MDPs**
2020 **Yash Chandak**, Georgios Theocharous, Shiv Shankar, Martha White,
Sridhar Mahadevan, Philip S. Thomas
International Conference on Machine Learning.

ICML **Evaluating the Performance of Reinforcement Learning Algorithms**
2020 Scott Jordan, **Yash Chandak**, Daniel Cohen, Mengxue Zhang, Philip S. Thomas
International Conference on Machine Learning.

AAAI **Lifelong Learning with a Changing Action Set**
2020 **Yash Chandak**, Georgios Theocharous, Chris Nota, Philip S. Thomas
Association for the Advancement of Artificial Intelligence.

AAAI **Reinforcement Learning When All Actions are Not Always Available**
2020 **Yash Chandak**, Georgios Theocharous, Blossom Metevier, Philip S. Thomas
Association for the Advancement of Artificial Intelligence.

ICML **Learning Action Representations for Reinforcement Learning**
2019 **Yash Chandak**, Georgios Theocharous, James Kostas, Scott Jordan, Philip S. Thomas

International Conference on Machine Learning.

Journal Publications

Frontiers 2022 **Scaling Graph Propagation Kernels for Predictive Learning**
Priyesh Vijayan, **Yash Chandak**, Mitesh M Khapra, Srinivasan Parthasarathy, Balaraman Ravindran
Frontiers in Big Data, section Data Mining and Management.

UMass 2022 **Reinforcement Learning for Non-Stationary Problems**
Yash Chandak
Ph.D. Thesis, University of Massachusetts Amherst

Workshop Publications and Others

OPT (NeurIPS) 2022 **Optimization using Parallel Gradient Evaluations on Multiple Parameters**
Yash Chandak, Shiv Shankar, Venkata Gandikota, Philip S. Thomas, Arya Mazumdar
OPT workshop at Neural Information Processing Systems.

RLDM 2022 **A Generalized Learning Rule for Asynchronous Coagent Networks**
James Kostas, Scott Jordan, **Yash Chandak**, Georgios Theocharous, Dhawal Gupta, Philip S. Thomas
Multidisciplinary Conference on Reinforcement Learning and Decision Making.

SafeRL (NeurIPS) 2021 **Behavior Policy Search for Risk Estimators in Reinforcement Learning**
Elita Lobo, **Yash Chandak**, Dharmashankar Subramanian, Josiah Hanna, Marek Petrik
Workshop on Safe and Robust Control of Uncertain Systems at NeurIPS.

HumanAI (ICML) 2021 **Intervention Aware Shared Autonomy**
Weihao Tan*, David Koleczek*, Siddhant Pradhan*, Nicholas Perello, Vivek Chettiar, Nan Ma, Aaslesha Rajaram, Vishal Rohra, Soundararajan Srinivasan, H M Sajjad Hossain†, **Yash Chandak**†
Human-AI Collaboration in Sequential Decision-Making, ICML. *Equal contribution, †Equal advising.

arXiv 2020 **Reinforcement Learning for Strategic Recommendations**
Georgios Theocharous, **Yash Chandak**, Philip S. Thomas, Frits de Nijs
Arxiv 2009.07346.

RLDM 2019 **Improving Generalization over Large Action Sets**
Yash Chandak, Georgios Theocharous, James Kostas, Scott Jordan, Philip S. Thomas
Multidisciplinary Conference on Reinforcement Learning and Decision Making.

RLDM 2019 **Evaluating RL Algorithms Using Cumulative Distributions of Performance**
Scott Jordan, **Yash Chandak**, Mengxue Zhang, Daniel Cohen, Philip S. Thomas
Multidisciplinary Conference on Reinforcement Learning and Decision Making.

CL (NeurIPs) 2018 **Reinforcement Learning with a Dynamic Action Set**
Yash Chandak, Georgios Theocharous, James Kostas, Philip Thomas
Continual Learning workshop at Neural Information Processing Systems.

arXiv 2018 **Classical Policy Gradient: Preserving Bellman's Principle of Optimality**
Philip S. Thomas, Scott Jordan, **Yash Chandak**, Chris Nota, James Kostas
Arxiv 1906.03063.

STAR-AI (IJCAI) 2018 **HOPF: Higher Order Propagation Framework for Deep Collective Classification**
Priyesh Vijayan, **Yash Chandak**, Mitesh M Khapra, Srinivasan Parthasarathy, Balaraman Ravindran
International Workshop on Statistical Relational AI, IJCAI.

MLG (KDD) 2018 **Fusion Graph Convolutional Networks**
Priyesh Vijayan, **Yash Chandak**, Mitesh M Khapra, Srinivasan Parthasarathy, Balaraman Ravindran
International Workshop on Machine Learning with Graphs, KDD.

HCOMP (AAAI) 2015 **On Optimizing Human-Machine Task Assignments**
Andreas Veit, Michael Wilber, Rajan Vaish, Serge Belongie,James Davis and **others**
AAAI Conference on Human Computation and Crowdsourcing, work-in-progress.

Patents

2023 **Reinforcement learning with a stochastic action set**
Georgios Theocharous, **Yash Chandak**
US Patent 11615293.

2022 **Lifelong learning with a changing action set**
Georgios Theocharous **Yash Chandak**
US Patent 11501207.

2022 **Forecasting and learning accurate and efficient target policy parameters for dynamic processes in non-stationary environments**
Yash Chandak, Georgios Theocharous, Sridhar Mahadevan
US Patent Application 17072868.

2020 **Generating and providing proposed digital actions in high-dimensional action spaces using reinforcement learning models**
Yash Chandak, Georgios Theocharous
US Patent Application 16261092.