

# CURRICULUM VITAE — GAUTAM GOEL

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**Research Interests:** Machine Learning, Control Theory

## Appointments:

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8/2022–	Postdoctoral Scholar Simons Institute & Foundations of Data Science Institute UC Berkeley
8/2015-5/2022	PhD Student Computing and Mathematical Sciences Department California Institute of Technology

## Academic Qualifications:

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2022	PhD. in Computing and Mathematical Sciences Thesis title: <i>Regret-Optimal Control</i> . Advisor: Babak Hassibi California Institute of Technology
2015	BSc. in Applied Mathematics Georgia Institute of Technology

## Awards:

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2022	Bhansali Family Doctoral Prize in Computer Science
2021	Named a Rising Star in Data Science by the University of Chicago
2018	Amazon AI4Science Fellowship
2015	National Science Foundation Graduate Research Fellowship
2014	Commendation by Georgia General Assembly (SR-902, 2013-2014 session)
2014	Georgia Tech School of Mathematics Outstanding Junior Award
2013	Goldwater Scholarship

## Preprints:

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- P2. **Gautam Goel**, Peter Bartlett: *Can a Transformer Represent a Kalman Filter?* Under submission at Learning for Dynamics and Control (LADC) 2024; preprint available at <https://arxiv.org/abs/2312.06937>
- P1. **Gautam Goel** and Babak Hassibi: *Measurement-Feedback Control with Optimal Data-Dependent Regret*. Under review at IEEE Transactions of Automatic Control.

## Publications in Peer-Reviewed Journals:

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- J2. **Gautam Goel** and Babak Hassibi: *Competitive Control*. IEEE Transactions on Automatic Control.
- J1. **Gautam Goel** and Babak Hassibi: *Regret-Optimal Estimation and Control*. Accepted at IEEE Transactions on Automatic Control, Special Issue on Learning and Control.

**Publications in Peer-Reviewed Conference Proceedings:** (\* denotes equal contribution)

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- C10. **Gautam Goel**, Naman Agarwal, Karan Singh, and Elad Hazan: *Best of Both Worlds in Online Control: Competitive Ratio and Policy Regret*. Learning for Dynamics and Control (L4DC) 2023.
- C9. **Gautam Goel** and Babak Hassibi: *The Power of Linear Controllers in LQR Control*. Invited Session on "Non-Asymptotic Learning and Control of Dynamical Systems", Conference on Decision and Control (CDC) 2022.
- C8. **Gautam Goel** and Babak Hassibi: *Online Estimation and Control with Optimal Pathlength Regret*. Learning for Dynamics and Control (L4DC) 2022.
- C7. Oron Sabag, **Gautam Goel**, Sahin Lale, and Babak Hassibi. *Regret-Optimal Full-Information Control*. American Control Conference (ACC) 2021.
- C6. **Gautam Goel** and Babak Hassibi. *Regret-Optimal Measurement-Feedback Control*. Learning for Dynamics and Control (L4DC) 2021.
- C5. Yiheng Lin, **Gautam Goel**, and Adam Wierman. *Online Optimization with Predictions and Non-Convex Losses*. SIGMETRICS 2020.
- C4. **Gautam Goel\***, Yiheng Lin\*, Haoyuan Sun\*, and Adam Wierman. *Beyond Online Balanced Descent: An Optimal Algorithm for Smoothed Online Optimization*. Neural Information Processing Systems (NeurIPS) 2019. **Spotlight Presentation**.
- C3. **Gautam Goel** and Adam Wierman. *An Online Algorithm for Smoothed Regression and LQR Control*. International Conference on Artificial Intelligence and Statistics (AISTATS) 2019. Extended abstract appeared at Real-World Sequential Decision Making Workshop, ICML 2019, and Mathematical Aspects of Performance Modelling (MAMA) Workshop, SIGMETRICS 2019.
- C2. Niangjun Chen\*, **Gautam Goel\*** and Adam Wierman. *Smoothed Online Convex Optimization in High Dimensions*. Conference on Learning Theory (COLT) 2018. Extended abstract appeared at Mathematical Aspects of Performance Modelling (MAMA) Workshop, SIGMETRICS 2018.
- C1. **Gautam Goel**, Niangjun Chen and Adam Wierman. *Thinking Fast and Slow: Optimization Decomposition Across Timescales*. Conference on Decision and Control (CDC) 2017. Extended abstract appeared at Mathematical Aspects of Performance Modelling (MAMA) Workshop, SIGMETRICS 2017.

**Invited talks:**

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| 2023 | BLISS Seminar, UC Berkeley                                                            |
| 2023 | Information Theory and Applications (ITA) Workshop                                    |
| 2022 | International Conference on Continuous Optimization (ICCOPT). Invited by Varun Gupta. |
| 2022 | ETH Zurich AI Center. Hosted by Florian Dörfler and Melanie Zeilinger.                |
| 2022 | Nikolai Matni's group in University of Pennsylvania ECE department.                   |
| 2022 | Vector Institute/University of Toronto. Hosted by Dan Roy and Angela Schoellig.       |
| 2021 | Na Li's group in Harvard SEAS department.                                             |
| 2021 | Princeton ALG-ML Seminar. Hosted by Elad Hazan                                        |
| 2021 | Madeleine Udell's group in Cornell University ORIE department.                        |
| 2021 | Statistical Machine Learning Seminar, UC Santa Barbara. Hosted by Yu-Xiang Wang.      |
| 2021 | Google DeepMind/University of Alberta. Hosted by Csaba Szepesvári.                    |
| 2019 | Conference on Information Sciences and Systems (CISS) at Johns Hopkins University.    |
| 2018 | Applied Probability Society (APS) at Northwestern University.                         |

**Student Mentoring:**

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2018–2019	Yiheng Lin (Tsinghua University → Caltech)
2018–2019	Haoyuan Sun (Caltech → MIT)
2023–	Sultan Daniels (UC Berkeley)
2023–	Wentinn Liao (UC Berkeley)
2023–	Saagar Sanghavi (UC Berkeley)

**Teaching:**

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2021	Mathematics of Signal Processing
2020	Adaptive Signal Processing
2018	Foundations of Machine Learning and Statistical Inference
2017	Applied Linear Algebra

**Departmental Service:**

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2021–2022	CMS Graduate Student Advisory Council
2017–2018	Keller Colloquium Committee

**Professional Service:**

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Journal reviewer	IEEE Trans. on Information Theory (IEEE T-IT), IEEE Trans. on Automatic Control (IEEE TAC), IEEE Trans. on Networking (IEEE TNET)
Conference reviewer	Neural Information Processing Systems (NeurIPS), International Conference on Artificial Intelligence and Statistics (AISTATS), Learning for Dynamics and Control (L4DC), Conference on Decision and Control (CDC), European Control Conference (ECC)