Stanford

Benjamin Van Roy

Professor of Electrical Engineering, of Management Science and Engineering and, by courtesy, of Computer Science

CONTACT INFORMATION

- **Administrator**

  Kara Marquez - Administrative Associate

  Email kara.marquez@stanford.edu

Bio

BIO

Benjamin Van Roy is a Professor at Stanford University, where he has served on the faculty since 1998. His current research focuses on reinforcement learning. Beyond academia, he leads a DeepMind Research team in Mountain View, and has also led research programs at Unica (acquired by IBM), Enuvis (acquired by SiRF), and Morgan Stanley.

He is a Fellow of INFORMS and IEEE and has served on the editorial boards of Machine Learning, Mathematics of Operations Research, for which he co-edited the Learning Theory Area, Operations Research, for which he edited the Financial Engineering Area, and the INFORMS Journal on Optimization. He received the SB in Computer Science and Engineering and the SM and PhD in Electrical Engineering and Computer Science, all from MIT, where his doctoral research was advised by John N. Tstitsiklis. He has been a recipient of the MIT George C. Newton Undergraduate Laboratory Project Award, the MIT Morris J. Levin Memorial Master's Thesis Award, the MIT George M. Sprowls Doctoral Dissertation Award, the National Science Foundation CAREER Award, the Stanford Tau Beta Pi Award for Excellence in Undergraduate Teaching, the Management Science and Engineering Department's Graduate Teaching Award, and the Lanchester Prize. He was the plenary speaker at the 2019 Allerton Conference on Communications, Control, and Computing. He has held visiting positions as the Wolfgang and Helga Gaul Visiting Professor at the University of Karlsruhe, the Chin Sophonpanich Foundation Professor and the InTouch Professor at Chulalongkorn University, a Visiting Professor at the National University of Singapore, and a Visiting Professor at the Chinese University of Hong Kong, Shenzhen.

ACADEMIC APPOINTMENTS

- Professor, Electrical Engineering
- Professor, Management Science and Engineering
- Professor (By courtesy), Computer Science
- Member, Bio-X
- Member, Institute for Computational and Mathematical Engineering (ICME)

HONORS AND AWARDS

- Fellow, INFORMS (2015)
- Fellow, IEEE (2019)

- Lanchester Prize, INFORMS (2022)

PROFESSIONAL EDUCATION

- BS, Massachusetts Institute of Technology , Computer Science and Engineering (1993)
- MS, Massachusetts Institute of Technology , Electrical Engineering and Computer Science (1995)
- PhD, Massachusetts Institute of Technology , Electrical Engineering and Computer Science (1998)

Teaching

COURSES

2025-26

- Aligning Superintelligence: CS 338, MS&E 338 (Spr)
- Markov Decision Processes: EE 283, MS&E 235A (Aut)
- Reinforcement Learning: Behaviors and Applications: EE 383, MS&E 235B (Win)

2023-24

- Aligning Superintelligence: MS&E 338 (Spr)
- Bandit Learning: Behaviors and Applications: EE 277, MS&E 237A (Aut)
- Reinforcement Learning: Behaviors and Applications: EE 370, MS&E 237B (Win)

2022-23

- Reinforcement Learning: Behaviors and Applications: EE 277, MS&E 237 (Aut)
- Reinforcement Learning: Frontiers: MS&E 338 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Mahdi Al-Husseini, Bella Hofflich, Samuel Liu, William Overman, Sahasrajit Sarmasarkar, Keertana Veeramony Chidambaram

Postdoctoral Faculty Sponsor

Alex Infanger

Doctoral Dissertation Advisor (AC)

Henrik Marklund, Wanqiao Xu, Yifan Zhu

Master's Program Advisor

Mahmood Alhusseini, Tyler Huang, Arya Marwaha, Roya Meykadeh, Xi Wang, Shatong Zhu

Doctoral (Program)

Semyon Lomasov, Henrik Marklund, Yifan Zhu

Publications

PUBLICATIONS

- **Deciding What to Learn: A Rate-Distortion Approach**
  Arumugam, D., Van Roy, B.
  edited by Meila, M., Zhang, T.
  JMLR-JOURNAL MACHINE LEARNING RESEARCH.2021

- **Deep Exploration via Randomized Value Functions** *JOURNAL OF MACHINE LEARNING RESEARCH*

Osband, I., Van Roy, B., Russo, D. J., Wen, Z.
2019; 20

- **Information-Theoretic Confidence Bounds for Reinforcement Learning**
  Lu, X., Van Roy, B.
  edited by Wallach, H., Larochelle, H., Beygelzimer, A., d'Alche-Buc, F., Fox, E., Garnett, R.
  NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2019

- **A Tutorial on Thompson Sampling** *FOUNDATIONS AND TRENDS IN MACHINE LEARNING*
  Russo, D. J., Van Roy, B., Kazerouni, A., Osband, I., Wen, Z.
  2018; 11 (1): 1–96

- **Scalable Coordinated Exploration in Concurrent Reinforcement Learning**
  Dimakopoulou, M., Osband, I., Van Roy, B.
  edited by Bengio, S., Wallach, H., Larochelle, H., Grauman, K., CesaBianchi, N., Garnett, R.
  NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2018

- **An Information-Theoretic Analysis for Thompson Sampling with Many Actions**
  Dong, S., Van Roy, B.
  edited by Bengio, S., Wallach, H., Larochelle, H., Grauman, K., CesaBianchi, N., Garnett, R.
  NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2018

- **Learning to Optimize via Information-Directed Sampling** *OPERATIONS RESEARCH*
  Russo, D., Van Roy, B.
  2018; 66 (1): 230–52

- **Conservative Contextual Linear Bandits**
  Kazerouni, A., Ghavamzadeh, M., Abbasi-Yadkori, Y., Van Roy, B.
  edited by Guyon, Luxburg, U. V., Bengio, S., Wallach, H., Fergus, R., Vishwanathan, S., Garnett, R.
  NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2017

- **Ensemble Sampling**
  Lu, X., Van Roy, B.
  edited by Guyon, Luxburg, U. V., Bengio, S., Wallach, H., Fergus, R., Vishwanathan, S., Garnett, R.
  NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2017

- **An Information-Theoretic Analysis of Thompson Sampling** *JOURNAL OF MACHINE LEARNING RESEARCH*
  Russo, D., Van Roy, B.
  2016; 17