# Kartik Ahuja

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**Contact Information**

35-156, IBM Research, Thomas J. Watson Research Center, Yorktown Heights, New York
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**Research Interests**

- Theory: Machine Learning, Optimization and Game Theory
- Applications: Healthcare, Wireless Communications

**Postdoctoral Experience**

AI Resident, IBM Research, Thomas J. Watson Research Center, NY — **Nov 2019 - present**

**Education**

**University of California, Los Angeles** — **Sep 2013-2019**
*PhD in Electrical and Computer Engineering*

- GPA: **4.0/4.0**

**University of Oxford** — **Jan -Dec 2017**
*Visiting PhD student*

**Indian Institute of Technology Kanpur** — **2008-2013**
*B. Tech - M. Tech Dual Degree in Electrical Engineering*

- CGPA: **8.8/10** (B. Tech) and **9.6/10** (M. Tech)

**Publications**

**Optimization and Machine Learning**

**K. Ahuja**, K. Shanmugam, K. R. Varshney, Amit Dhurandhar, "Invariant Risk Minimization Games", submitted.

**K. Ahuja**, A. Dhurandhar, K. Shanmugam, K. R. Varshney, "Learning to Initialize Gradient Descent using Gradient Descent", submitted.

**K. Ahuja**, P. Sattigeri, K. Shanmugam, M. Kocaglu, D. Wei, K.N. Ramamurthy, "Conditional Independent Data Generation and its Applications", submitted.

A. Dhurandhar, T. Pedapati, A. Balakrishnan, P. Chen, K. Shanmugam, **K. Ahuja**, and R. Puri, "Model Agnostic Contrastive Explanations for Classification Models", submitted.

**K. Ahuja**, W. Zame, M. van der Schaar, "Optimal Piecewise Approximations for Model Interpretation", in *53rd Annual Asilomar Conference on Signals, Systems, and Computers* (ACSSC, 2019). **Second best student paper award.**

**K. Ahuja**, "Estimating Kullback-Leibler Divergence Using Kernel Machines", in *53rd Annual Asilomar Conference on Signals, Systems, and Computers* (ACSSC, 2019).

**K. Ahuja**, M van der Schaar, "Joint Concordance Index", in *53rd Annual Asilomar Conference on Signals, Systems, and Computers* (ACSSC, 2019).

**K. Ahuja**, M. Tran, "Convolutional Neural Networks Based Random Projections Method with Applications to EEG Prediction Tasks", extended abstract in *IEEE Biomedical and Health Informatics Conference* (BHI, 2019).

**K. Ahuja**, W. Zame, M. van der Schaar, "Dpscreen: Dynamic Personalized Screening", in *Neural Information Processing Systems* (NeurIPS, 2017).

**K. Ahuja**, M. van der Schaar, "Joint Concordance of Prognostic Models with Competing Risks", in *Neural Information Processing Systems workshop on Machine Learning for Healthcare* (NeurIPS, ML4H, 2017).

**K. Ahuja**, M. van der Schaar, "Dynamic Matching and Allocation of Tasks", in *ACM Transactions on Economics and Computation*, vol. 7 no. 1, pp 1-27, 2019, and a short version appeared in *30th International Conference on Game Theory* (ICGT, 2019).

**K. Ahuja**, Y. Xiao, M. van der Schaar, "Efficient Interference Management Policies for Femtocell Networks", in *IEEE Transactions on Wireless Communications*, vol. 14, no. 9, pp 4879-4893 (2015). **Featured in** IEEE-spotlight and in UCLA-news.

**K. Ahuja**, Y. Xiao, M. van der Schaar, "Distributed Interference Management Policies for Heterogeneous Small-Cell Networks", in *IEEE Journal on Selected Areas in Communications*, vol. 33, no. 6, pp. 1112-1126 (2015). **Featured in IEEE MMTC letter, December, 2016.**.

Y. Xiao, **K. Ahuja**, M. van der Schaar, "Spectrum Sharing For Delay-Sensitive Applications with Continuing QoS Guarantees", accepted in *IEEE Global Communications Conference,* (GLOBECOM, 2014). **Nominated for the Best paper award and featured in the "Elite-Class" of top 50 (2.5 %) papers amongst 2100 submitted.**

**K. Ahuja**, M. Hasan, J. Hossain, "To Participate or Not in Spectrum Auctions with Entry fee: Bayesian Game Theoretic Approach", in *Proc. of IEEE Wireless Communications and Networking Conference,* (WCNC, 2014).

## Network Science

**K. Ahuja**, M. van der Schaar, W. Zame, "Working alone and working with others: implications for the malthusian era", Economic Theory, pp.1-35 (2019).

A. Alaa, **K. Ahuja**, and Mihaela van der Schaar, "A Micro-Foundation of Social Capital in Evolving Social Networks", *IEEE Transactions on Network Science and Engineering* vol. 5, no. 1, pp. 14-31 (2017).

A. Alaa, **K. Ahuja**, M. van der Schaar, "Self-organizing Networks of Information Gathering Cognitive Agents", in *IEEE Transactions on Cognitive Communications and Networking*, vol. 1. no. 1, pp 100-112 (2015).

**K. Ahuja**, S. Zhang, M. van der Schaar, "Towards a Theory of Societal Co-Evolution: Individualism versus Collectivism", in *IEEE Global Conference on Signal and Information Processing, GlobalSIP* (2014).

**K. Ahuja**, S. Zhang, M. van der Schaar, "The Population Dynamics of Websites", in *Netecon workshop at ACM Conference on Economics and Computation* (2015).

## Patents

**K. Ahuja**, K. Shanmugam, K. R. Varshney, A. Dhurandhar, "A System and Method for Learning Causal Representations and Invariant Predictors", under review for patentability search.

**K. Ahuja**, A. Dhurandhar, K. Shanmugam, K. R. Varshney, "A System and Method for Initializing Optimization Solvers", under review for patentability search.

## Academic Achievements

- Awarded the 2018-19 UCLA Dissertation Year Fellowship.
- Awarded the 2013-14 Guru Krupa Foundation Fellowship by the ECE Department at UCLA.
- Awarded the Departmental Fellowship by the ECE Department at UCLA for the fall quarter 2013.
- Secured an All India Rank of 584 in Joint Entrance Examination 2008 (99.8 percentile) among more than 3,50,000 students.
- Secured an All India Rank of 1131 in All India Engineering Entrance Examination 2008 (99.8 percentile) among more than 7,50,000 students.

## Invited Talks

- "Invariant Risk Minimization Games", Facebook Artificial Intelligence Research (FAIR), NY.
- "Invariant Risk Minimization Games", Computer Science Department, Yale University.

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| Teaching Experience | • Teaching Assitant at UCLA for Digital Signal Processing, Network Economics and Game Theory, and Multimedia Communications. |
| | • Student Volunteer, National Sevice Scheme, IIT Kanpur: Weekly tutoring of a group of ten underpriveleged students and motivated them for higher education. |
| Professional Experience | Reviewer for Neural Information Processing Systems (NeurIPS) 2019, 2020, International Conference on Machine Learning (ICML) 2019, Association for Advancement of Artificial Intelligence (AAAI) conference 2020, IEEE Global Communciations Conference (GLOBECOM), National Conference on Communications (NCC), India. |
| | Technical Program Committee (TPC) for Journal of Selected Areas in Communications. |
| Internship | University of British Columbia, UBC, Canada, May-July 2012 |
| Programming Skills | **Languages**: Python, R, Java, Matlab<br>**Libraries:** Tensorflow, keras, sklearn |