Saurabh Khanna

Contact Information

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Research Interests

Fairness of knowledge recommendations (vis-à-vis recommender systems) and possible ways to balance knowledge relevance with knowledge diversity

Combining insights from network analysis, machine learning, and game theory to understand aspects reshaping education in developing nations

Education

Stanford University, California, USA

Ph.D., Educational Policy (Ph.D. Minor in Computer Science), June 2023[1]

- Advisors: Prof. Prashant Loyalka, Prof. Ben Domingue

M.A., Economics, June 2021

Tata Institute of Social Sciences, Mumbai, India

M.A., Elementary Education, May, 2017

Birla Institute of Technology and Science, Pilani, India

B.S., Computer Science, May, 2012

Honors and Awards

William R. and Sara Hart Kimball Stanford Graduate Fellowship Award (Annual Award of $46,000 for 3 years), 2018-21

Stanford Impact Labs Research Fellow (Research Award of $3,500), 2020

Immigration Policy Lab Collaborative Research Fellow (Research Award of $4,500), 2019

Institute Silver Medal Award, Master of Arts in Elementary Education, Tata Institute of Social Sciences, 2017

National Talent Search Examination Scholar, Government of India [Top 0.2% of 500000], 2006-12

Winner, Project on 3-Dimensional Imaging at APOGEE technical festival, BITS Pilani, 2010

All India Rank 562, All India Engineering Entrance Examination [Top 0.05% of 1000000], 2008

All India Rank 14 and 34, National Science Olympiad, 2007-2008

Research Experience

Stanford University, California, USA

Research Assistant, Graduate School of Education **September 2018 - present**
Research Consultant, Freeman Spogli Institute **May 2017 - July 2018**
PI: Prof. Prashant Loyalka

- Led protocol design and coordination for the SuperTEST Project - A large-scale international study to understand and improve the quality of technical education received by youth in developing economies
- Cleaned and analyzed data for 70000 students, 5000 faculty, and 400 department heads from technical education institutes in China, Russia, India, and South Korea

[1] I will be submitting my qualifying paper before September 2020

Immigration Policy Lab, Stanford University, California, USA

Graduate Research Fellow **June 2019 - present**
PI: Prof. David D. Laitin

- Designed low-cost Interactive Voice Response surveys assessing integration for immigrants
- Configured short message servers and data storage servers to disseminate survey invites and record survey responses respectively

The World Bank, New Delhi, India

Research Consultant **June 2018 - August 2018**
PI: Dr. Tara Beteille

- Coordinated data analysis, data cleaning, and data management for 118 government engineering institutes under the purview of Technical Education Quality Improvement Programme (TEQIP)
- Employed social network analyses to assess homophily and integration among students on account of affirmative action policies
- Automated Python emailing scripts and conducted psychometric analysis towards sharing scaled performance reports with institutes

Center for Education, Innovation and Action Research, Mumbai, India
A collaborative intiative between *Tata Institute of Social Sciences (TISS)* and *Massachusetts Institute of Technology (MIT)*

Research Assistant, Connected Learning Initiative (CLIx) **June 2015 - April 2017**
PI: Prof. Padma Sarangapani (TISS) and Prof. Vijay Kumar (MIT)

- Designed mathematics curriculum to improve the professional and academic prospects of 165 thousand high school students from underserved communities
- Refined digital and hands-on activities to match the cultural and social capital of students across 4 Indian states – Telangana, Chhattisgarh, Mizoram, and Rajasthan
- Led development of a game 'Police Quad' to develop geometric reasoning proficiency in learners

Teaching Experience

Teach For India, New Delhi, India

Fellow/Multi-subject Elementary Teacher **May 2013 - May 2015**

- Taught and worked to bridge the achievement gap of 34 students (Grades 4 and 5) in a low-fee private school in Seelampur, East Delhi
- Achieved average grade level growth of 3.9 years with 75% of students reaching their grade levels
- Raised funds amounting to INR 1.2 lakhs leading to improvement in school infrastructure and creation of a library, to encourage reading and thereby improve reading levels
- *Co-Founder and Curriculum Developer, 'Khel Khel Mein'*, an initiative providing underprivileged children with guidance and opportunities to participate in an organized sport

Industry Experience

Juniper Networks, Bengaluru, India

Software Engineer **June 2012 - May 2013**

- Reduced IPS network parsing time by 97% by implementing prediction algorithms
- Led development on provisioning part of the security code base
- Redesigned user interfaces in XML and JavaScript and implemented their backend functionality through Java

Publications

Silverman, R., Johnson, E., Keane, K., **Khanna, S.** (2020). Beyond decoding: A meta-analysis of the effects of language comprehension interventions on K-5 students' language and literacy outcomes. *Reading Research Quarterly* `https://doi.org/10.1002/rrq.346`

Loyalka, P., Liu, O. L., Li, G., Chirikov, I., Kardanova, E., Gu, L., Ling, G., Yu, N., Guo, F., Ma, L., Hu, S., Johnson, A. S., Bhuradia, A., **Khanna, S.**, Froumin, I., Shi, J., Choudhury, P. K., Beteille, T., Marmolejo, F., Tognatta, N. (2019). Computer science skills across China, India, Russia, and the United States. *Proceedings of the National Academy of Sciences*, 201814646 `https://doi.org/10.1073/pnas.1814646116`

Khanna, S. (2017). Through the Sociological Lens: Learning Mathematics in a Mumbai Classroom. *For the Learning of Mathematics 37*(3), 24-26. ISSN 0228-0671

Conference Presentations

Khanna, S. (2020). Is the Internet Impartial? Diversity in Knowledge Recommendation in Online Networks. *2020 Sunbelt Virtual Conference*

Khanna, S., Loyalka, P. (2020). Friendship Networks in College. *Conference on Educational Data Science*

Khanna, S., Loyalka, P. (2020). Affirmative Action and Social Integration in College. *SREE Spring 2020 Conference, Practical Significance and Meaningful Effects: Learning and Communicating What Matters, Arlington*

Khanna, S., Gajinkar, A., Roy, A., Chatterji, A., Bapat, A., Bose, A. (2017). Rigor as Familiarity in Mathematics Assessments. *41st Annual Meeting of the International Group for the Psychology of Mathematics Education, Singapore*

Bapat, A., **Khanna, S.**, Srinivas, S., Thirumalai, B., Kumar, R., Rahaman, J., Chougale, S., Bose, A. (2017). Facilitating Geometry Learning through Blended Curriculum. *41st Annual Meeting of the International Group for the Psychology of Mathematics Education, Singapore*

Srinivas, S., **Khanna, S.**, Rahaman, J., Kumar, V. (2016). Designing a Game-Based Learning Environment to Foster Geometric Thinking. *2016 IEEE Eighth International Conference on Technology for Education (T4E)* (pp. 72-79). IEEE.

Khanna, S. (2016). Cost-effective pedagogies for implementing efficient inclusive schooling. *6th International Conference on Science of Human Learning, Delhi*

Khanna, S. (2016). Designing evidence based games to assess mathematical thinking. *TSG 42 of the 13th International Congress on Mathematics Education, Hamburg*

Invited Talks

January 20, 2017. *Reservation under the Right to Education Act.* Quality Education Support Trust (QUEST)

December 30, 2015. *Identity and the Textbook.* Center for Education, Innovation and Action Research Seminar Series

Relevant Internships

National Center for Antarctic and Ocean Research (Ministry of Earth Sciences), Goa, India
Research Analyst, Polar Remote Sensing Lab **May 2010 - July 2010**

SAP SuccessFactors, Bengaluru, India
Software Developer, Data Analytics **July 2011 - December 2011**

TECHNICAL SKILLS

- Statistical Packages: R (Tidyverse), Stata, Python (Scikit-learn, StatsModels), SPSS
- Languages: R, Python, SQL, MATLAB/Octave, Java, C, JavaScript, C#.NET, Unix shell
- Applications: Visual Studio, Microsoft SQL Server, Spyder, Jupyter, Gephi, LaTeX, Adobe Photoshop

LANGUAGES

- Fluent: English, Hindi, Punjabi
- Conversational: Spanish