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Kartik Hosanagar
Curriculum Vitae

The Wharton School
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EXPERIENCE

2003 – present — The Wharton School, University of Pennsylvania
Associate Professor, Operations and Information Management (June 2009 -)
Assistant Professor (January 2004 – May 2009)
Lecturer (July-December 2003)

2005 – 2008 — Cofounder, Yodle Inc
Developed the algorithms that were the firm's core Intellectual Property (IP) at founding.
Developed the business plan with cofounders
Consulting chief scientist (2005-2006); Advisory board (2006-2008)

1999 - 2003 — Carnegie Mellon University, Pittsburgh, USA
Research Assistant

1999 — Honeywell Software Operations, Bangalore, India
Designed a system for transfer of building automation data over the Internet.

1998 — Novell Inc, Bangalore, India (Quality Management Group)
Developed a version control module for the Quality Management Group.

EDUCATION

Ph.D., Management Science and Information Systems, Carnegie Mellon University, (1999-2003).

- *William Cooper Award* for best thesis in Management or Management Science, 2004

M. Philosophy in Management Science and Information Systems, Carnegie Mellon University, 2003.

M. Science in Information Systems (with distinction), Birla Institute of Technology and Science (BITS), Pilani, India, 1999.

- *Valedictorian*, graduating class of Information Systems

B.E., Electronics and Instrumentation Engineering (with distinction), Birla Institute of Technology and Science (BITS), Pilani, India 1998.

- *Valedictorian***,** graduating class of Electronics and Instrumentation
- Awarded BITS Pilani "30 under 30" award, December 2005

HONORS

- Wharton MBA core curriculum award to the professor "who goes above and beyond the call of duty", 2009.
- Wharton Graduate Division's Excellence in Teaching Award, 2009.
- Wharton Undergraduate Division's Excellence in Teaching Award, 2009.
- Nominated for Wharton school's Helen Kardon Moss Anvil award, 2008.
- Finalist, INFORMS JFIG best research paper, 2008.
- Wharton Graduate Division's Excellence in Teaching Award, 2008.
- Wharton MBA core curriculum award to the professor "who goes above and beyond the call of duty", 2007.
- *30 under 30 Award* from BITS Pilani Alumni Association, 2005.
- *William Cooper Award* for best thesis in Management or Management Science, 2004.
- Finalist, *Best Paper Award*, Workshop on Information Technology and Systems, 2002.
- *Best Paper Award*, Consortium on Technology, Policy and Management, 2002.
- eBRC (e-Business Research Center) *Doctoral Dissertation Award*, 2002.
- Offered the Castanga fellowship (1999-2000) at University of California, Berkeley (declined to attend CMU).
- *National Talent Scholar* (NTS), awarded by the Government of India.
- University scholarship awarded by B.I.T.S, Pilani to the top ten students on the basis of scholarship and leadership (1994-95).

PUBLICATIONS

Articles Published in Refereed Journals

1. Montgomery, A., K. Hosanagar, R. Krishnan, and K. Clay. 2004. Designing a Better Shopbot. *Management Science*, Vol. 50, No. 2, pp. 189-206.

2. Hosanagar, K., R. Krishnan, J. Chuang, and V. Choudhary. 2005. Pricing and Resource Allocation in Caching Services with Multiple Levels of Quality of Service. *Management Science*, Vol. 51, No. 12, pp. 1844-1859.

3. Hosanagar, K., J. Chuang, R. Krishnan, and M. Smith. 2008. Service Adoption and Pricing of Content Delivery Network (CDN) Services. *Management Science*, Vol. 54, No. 9, pp. 1579-1593.

4. Hartmann, W., P. Manchanda, H. Nair, M. Bothner, P. Dodds, D. Godes, K. Hosanagar, and C. Tucker. 2008. Modeling Social Interactions: Identification, Empirical Methods and Policy Implications. *Marketing Letters*, Vol. 19, pp. 287-304.

5. Fleder, D. and K. Hosanagar. 2009. Blockbuster Culture's Next Rise or Fall: The Impact of Recommender Systems on Sales Diversity. *Management Science*, Vol. 55, No. 5, pp. 697-712.

6. Hosanagar, K., P. Han, and Y. Tan. 2010. Diffusion Models for Peer-to-Peer (P2P) Media Distribution: On the Impact of Decentralized, Constrained Supply. *Information Systems Research*, Vol. 21, No. 2, pp. 271-287.

7. R. Guerin and K. Hosanagar. 2010. Fostering IPv6 Migration Through Network Quality Differentials. *ACM SIGCOMM Computer Communication Review*, Vol. 40, No. 3, July 2010, pp. 17-25.

8. Hosanagar, K. 2010. User-Centric Operational Decision-Making in Distributed Information Retrieval. Forthcoming in *Information Systems Research*.

9. Sen, S., Y. Jin, R. Guerin, and K. Hosanagar. 2010. Modeling the Dynamics of Network Technology Adoption and the Role of Converters. *ACM Transactions on Networking*, Forthcoming.

10. Hosanagar, K., and Y. Tan. 2008. Cooperative Cashing?: An Economic Analysis of Document Duplication in Cooperative Web Caching. Conditionally Accepted at *Information Systems Research*.

Book Chapters

11. Hosanagar, K. 2008. CDN Pricing. In *Content Delivery Networks: Principles and Paradigms*, R. Buyya, A. K. Pathan, and A. Vakali (eds.), Springer.

Articles Under Review or Revision

12. Agarwal, A., K. Hosanagar, and M. Smith. 2008. Location, Location, Location: An Analysis of Profitability of Position in Online Advertising Markets. Under Review.

13. Hosanagar, K. and V. Abhishek. 2010. Optimal Bidding in Multi-Item Multi-Slot Sponsored Search Auctions. Under Review.

14. Abhishek, V., K. Hosanagar and P. Fader. 2010. On the Aggregation Bias in Sponsored Search Advertising.

Working Papers

15. Hosanagar, K., P. Han, and Y. Tan. 2008. Dynamic Referrals in Peer-to-Peer Media Distribution.

16. Fleder, D., K. Hosanagar and A. Buja. 2010. Recommender Systems and their Effects on Consumers: The Fragmentation Debate.

17. Bakshi, N., K. Hosanagar, and C. Van den Bulte. 2008. New Product Diffusion with Two Interacting Segments or Products.

Papers in Refereed Conference Proceedings (many of these articles were the origins of journal articles listed above)

18. "Recommender Systems and their Effects on Consumers: The Fragmentation Debate," Fleder, D., K. Hosanagar and A. Buja, Proceedings of ACM Conference on Electronic Commerce (EC), June 2010.

19. "Shared Versus Separate Networks – The Impact of Reprovisioning." S. Sen, R. Guerin, and K. Hosanagar, Proceedings of ACM ReArch'09 Workshop, Rome, Italy, December 2009.

20. "Modeling User Click Behavior in Sponsored Search," V. Abhishek, P. Fader, K. Hosanagar, Proceedings of the *Workshop on Information Technology and Systems* (WITS), December 2008.

21. "Recommended For You: The Impact of Profit Incentives on the Relevance of Online Recommendations," Hosanagar, K., R. Krishnan, and L. Ma, Proceedings of the *International Conference on Information Systems* (ICIS), Paris, December 2008.

22. "Bid Determination in Stochastic Multi-slot Auctions," Hosanagar, K. and V. Cherepanov, Proceedings of the *Conference on Information Systems & Technology* (CIST), Washington DC, October 2008. An extended version appears as paper #11.

23. “Dynamics of Competition Between Incumbent and Emerging Network Technologies,” Jin, Y., S. Sen, R. Guerin, K. Hosanagar, and Z. Zhang, Proceedings of *ACM NetEcon Workshop*, Seattle, August 2008. An extended version appears as paper #13.

24. “Optimal Bidding in Stochastic Budget Constrained Slot Auctions,” Hosanagar, K. and V. Cherepanov, Proceedings of *ACM Conference on electronic commerce* (EC), Chicago, July 2008. Acceptance Rate: 19%. An extended version appears as paper #11.

25. “A Missing Data Paradox for Nearest Neighbor Recommender Systems,” Fleder, D. and K. Hosanagar, Proceedings of the *Workshop on Information Technology and Systems* (WITS), December 2007.

26. "Recommender Systems and their Impact on Sales Diversity," Fleder, D. and K. Hosanagar, Proceedings of *ACM Conference on electronic commerce* (EC), San Diego, June 2007. Acceptance Rate: 27%. An extended version appears as paper #5.

27. "Optimal Rebating Strategies in Peer-to-Peer Content Distribution," Han, P., K. Hosanagar, and Y. Tan., Proceedings of the *International Conference on Information Systems* (ICIS), Las Vegas, December 2005. Acceptance Rate 12%. An extended version appears as paper #8.

28. "A Utility Theoretic Approach to Determining Optimal Wait Times in Distributed Information Retrieval," Hosanagar, K., Proceedings of the *ACM SIGIR Conference*, Salvador, Brazil, August 2005. Acceptance Rate 19%. An extended version appears as paper #9.

29. “Diffusion of Digital Products in Peer-to-Peer Networks,” Han, P., K. Hosanagar, Y. Tan, Proceedings of the *International Conference on Information Systems* (ICIS), Washington D. C., December 2004. Acceptance Rate 16%. An extended version appears as paper #4.

30. “Optimal Duplication in Cooperative Web Caching,” Hosanagar, K., Y. Tan, Proceedings of the 13th *Workshop on Information Technology and Systems (WITS)*, Washington D. C., December 2004. Acceptance Rate: 26%. An extended version appears as paper #10.

31. “Optimal Rebating Strategies in P2P Diffusion,” Han, P., K. Hosanagar, and Y. Tan, Proceedings of the 13th *Workshop on Information Technology and Systems (WITS)*, Washington D. C., December 2004. Acceptance Rate: 26%. An extended version appears as paper #8.

32. “Optimal Pricing of Content Delivery Network (CDN) Services,” Hosanagar, K., R. Krishnan, J. Chuang, and M. Smith, Proceedings of the *Hawaii International Conference on Systems and Sciences (HICSS)*, Hawaii, January 2004. An extended version appears as paper #3.

33. “Service Adoption and Pricing of Content Delivery Network (CDN) Services,” Hosanagar, K., J. Chuang, and R. Krishnan, Proceedings of the 12th *Workshop on Information Technology and Systems (WITS)*, Seattle, December 2003. Acceptance Rate: 29%. An extended version appears as paper #3.

34. “Optimal Pricing and Capacity Allocation in Vertically Differentiated Web Caching Services,” Hosanagar, K., R. Krishnan, J. Chuang, and V. Choudhary, Proceedings of the *International Conference on Information Systems (ICIS)*, Barcelona, December 2002. Acceptance Rate: 19%. An extended version appears as paper #2.

35. “Simulation/Optimization Based Design of Comparison Shopping Engines,” Hosanagar, K., I. Karaesman, R. Krishnan, and A. Montgomery, Proceedings of the 11th *Workshop on Information Technology and*

Systems (WITS), Barcelona, December 2002. (Best paper award finalist). Acceptance Rate: 25%. An extended version appears as paper #1.

36. "Equilibrium Reputation Mechanism for Mobile Agent based Electronic commerce," Wang, X. F., K. Hosanagar, R. Krishnan, and P. K. Khosla, Proceedings of *ACM International conference on Autonomous Agent and Multi-agent Systems* (*AAMAS*), pages: 308-309, Poster paper, 2002. The new title of the extended version is "Ratings in Inspection Games: Initial Rating and dynamics".

37. "Pricing and Resource Allocation in Caching Services with Multiple Levels of QoS," Chuang, J., K. Hosanagar, and R. Krishnan, Proceedings of the 10th *Workshop on Information Technology and Systems (WITS)*, New Orleans, December 2001. Acceptance Rate: 28%. An extended version appears as paper #2.

<u>Papers in Other Conference Programs (Not Refereed)</u>

- "Modeling User Click Behavior in Sponsored Search," V. Abhishek, P. Fader, K. Hosanagar, Symposium on Statistical Challenges in eCommerce Research (SCECR'09), Pittsburgh, May 2009.
- "Recommender Systems and their Effects on Consumers: The Fragmentation Debate," Fleder, D. and K. Hosanagar. In Workshop on Information Systems and Economics (WISE), Paris, December 2008.
- "Location, Location and Location: An Analysis of Profitability and Position in Online Advertising Markets," Agarwal, A., K. Hosanagar, and M. Smith. Fourth Symposium on Statistical Challenges in eCommerce Research (SCECR'08), New York, May 18-19, 2008.
- "A Missing Data Paradox for Nearest Neighbor Recommender Systems," Fleder, D. and K. Hosanagar. Fourth Symposium on Statistical Challenges in eCommerce Research (SCECR'08), New York, May 18-19, 2008.
- "Blockbuster culture's next rise or fall: The impact of recommender's on sales diversity," Fleder, D. and K. Hosanagar. INFORMS Marketing Science Conference, Vancouver, British Columbia, Canada, June 12-14, 2008.
- "Location, Location and Location: An Analysis of Profitability and Position in Online Advertising Markets," Agarwal, A., K. Hosanagar, and M. Smith. INFORMS Marketing Science Conference, Vancouver, British Columbia, Canada, June 12-14, 2008.
- "Location, Location and Location: An Analysis of Profitability and Position in Online Advertising Markets," Agarwal, A., K. Hosanagar, and M. Smith. In Workshop on Information Systems and Economics, Montreal, December 2007.
- "Keyword Generation in Sponsored Search," Abhishek, V. and K. Hosanagar, Proceedings of the International Conference on Electronic Commerce, Minneapolis, August 2007. *Invited Paper*.
- "Blockbuster culture's next rise or fall: The impact of recommender's on sales diversity," Fleder, D. and K. Hosanagar, In Workshop on Information Systems Economics, Chicago, December, 2006.
- "Optimal Bidding in Online Slot Auctions," Hosanagar, K. and P. Stavrinides, Presented in International Symposium of Information Systems, Indian School of Business, Hyderabad, India.
- "Challenges in Grid Marketplace Design," Hosanagar, K. and R. Krishnan, Proceedings of the Workshop on Grid Economics, Singapore, June, 2006. *Invited Paper*.
- "A Utility Theory based Approach to Shopbot Design," Clay, K., K. Hosanagar, R. Krishnan, and A. Montgomery, Proceedings of the *CASOS conference*, Pittsburgh, June 2002.
- "Pricing Caching Services with Multiple Levels of QoS," Chuang, J., K. Hosanagar, R. Krishnan, Proceedings of the *Workshop on Digitization of Commerce*, Maastricht, Netherlands, November 2001.
- "Pricing Caching Services with Multiple Levels of QoS," Hosanagar, K., J. Chuang, R. Krishnan, Proceedings of the *IEEE Conference on Systems, Man and Cybernetics*, Tucson, Arizona, October, 2001.

TEACHING

- OPIM 314: Enabling Technologies, Undergraduate elective, Spring 2004 (evaluations: 3.59/4.00), Spring 2006 (3.60/4.00), Fall 2007 (3.65/4.00).
- OPIM 662: Enabling Technologies, MBA elective at Wharton School, Spring 2004 (3.43/4.00), Spring 2006, (3.47/4.00), Spring 2007 (3.45/4.00), Fall 2007 (3.65/4.00).
- OPIM 621: Decision Models & Uncertainty, MBA core at Wharton School, Fall 2004 (3.34/4.00), Fall 2006 (3.30/4.00), Fall 2007 (3.90/4.00).
- OPIM 950: Ph.D. IS Seminar, Fall 2005 (3.75/4.00).
- Executive Education classes and Advanced Topics classes on Internet Marketing, Trends in Internet Media, and Strategic Relevance of IT.
    - Sample clients: American Express, ADP, China Minsheng Bank (China), Wipro Inc (India).

RESEARCH GRANTS

- Global Initaitives Center research award for "Impact of Digital Movie Distribution on Media Piracy in India", 2009.
- Mack Center for Technological Innovation grant for "Modeling Consumer Behavior in Sponsored Search," 2009.
- NYU NET Institute summer research award for "Recommender Systems and their Effects on Consumers: The fragmentation Debate," 2008 (with Daniel Fleder).
- $1.2M grant from NSF for proposal titled "On the Economic Viability of Network Architectures," 2007 (with co-PIs Roch Guerin, Andrew Odlyzko, and Zhi-Li Zhang). Project investigates the economics of the next generation Internet.
- NYU NET Institute summer research award for "Recommender Systems and their Effects on Diversity, Product Success and Consumer Networks," 2007 (with Daniel Fleder).
- Mack Center of Technological Innovation grant for proposal "Recommender Systems and the Long Tail," 2008.
- Mack Center of Technological Innovation grant for proposal "Decision Frameworks for Budget Allocation in Cross-channel Online Advertising," 2007.
- Wharton-SMU research grant on "Markets for Grid Computing," 2006.
- Wharton e-Business Initiative (WeBI) grant for proposal "Product Design and Competition in Search Engine Market," 2005.
- Wharton-SMU research grant on "Markets for Grid Computing," 2005.
- Mack Center of Technological Innovation grant for proposal "Software Agents for Information Search," 2004.

INVITED TALKS/PRESENTATIONS

- Impact of Recommenders on Consumer Fragmentation (January 2009 -)
    - Stanford University (MS&E)
    - University of Texas, Dallas
    - Emory University
- *Data-Driven strategies for Web 2.0*. Plenary panel at the winter conference on IS, Utah, 2009.
- *Impact of Recommenders on Sales Diversity* (Fall 2007-Spring 2008)
    - Carnegie Mellon University
    - Stanford University (Marketing Department)
    - NYU Stern (IOMS Dept)
    - Net Institute, NYU

  - University of Connecticut
  - University of Washington, Seattle
  - Stanford University (OIT)
  - University of British Columbia, Vancouver, Canada
  - INSEAD
  - University of Minnesota
- *Investing in Research and Practice to Increase Value of Recommenders*. Plenary panel presentation, ACM Recommender Systems conference (RecSys) 2007.
- *Tutorial on Sponsored Search*. Invited tutorial in ACM Conference on electronic commerce. June 2007.
- *Bidding in Sponsored search Auctions*
  - Search Engine Marketing Conference, Princeton, February 2007.
  - Computer and Information Systems (CIS), University of Pennsylvania, October, 2006.
  - Singapore Management University, May 2006.
- Moderator, "Under 40 entrepreneurs", Wharton Entrepreneurship Conference, November 2006
- Moderator, Young entrepreneur panel, Wharton Entrepreneurship Conference, 2007.
- Moderator, Venture Capital panel, Wharton Technology Conference, February 2006.
- *Competition and Vertical Integration in the Search Engine Market*, Singapore Management University, (2005).
- *Strategic Value of IT Deployments*, Wipro Systems (2005).
- *Information Explosion and its Impact* (2005).
  - Singapore Management University
  - Indian Institute of Information Technology
- *Pricing Web Caching Services with Multiple Quality Levels* (2003)
  - University of Rochester
  - New York University
  - University of Washington, Seattle
  - University of Pennsylvania
  - Purdue University
  - Pennsylvania State University
  - Tulane University
- *Designing Smarter Shopbots* (2002).
  - Nanyang Business School, Singapore
  - ObjectOrb Technologies, India
  - Indian Institute of Information Technology (IIIT)

ACADEMIC SERVICE

Co-chair: Third workshop on sponsored search, Banff, Canada, May 2007; co-chair of the first Internet Monetization Track at the 17th International World Wide Web Conference (WWW2008), Track chair at ICEC 2009.

Associate Editor: Information Systems Research; International Conference on Information Systems (2007, 2009).

Program Committee: ACM Conference on Electronic Commerce (EC) (2006, 2007, 2008); INFORMS Conference on Information Systems and Technology (CIST) (2004, 2005, 2006, 2007); Workshop on Information Technology and Systems (WITS) (2007, 2008); Workshop on e-Business (2005, 2006, 2007); Workshop on Grid Economics (2006, 2007); International Conference on electronic commerce (ICEC) (2007).

Reviewer: Management Science, Information Systems Research (ISR), Marketing Science, Decision Support Systems, Interfaces, Information Technology and Management, International Journal of Electronic Commerce, ACM conference on electronic commerce, International Conference on Information Systems, Journal of Database Management, Hawaii International Conference on System Sciences.

Service@Wharton: Faculty Recruiting Committee (2006-07); PhD Admissions Committee (2007), Seminar committee (2008).

Doctoral Students: Daniel Fleder (current); Vibhanshu Abhishek (current), thesis committee member for Peng Han (University of Washington, Seattle) and Siddharth Jayanthy.

PERSONAL

Country of citizenship: India
U.S. Visa status: Permanent Resident