Management Department

The Wharton School
University of Pennsylvania

2000 Steinberg Hall-Dietrich Hall
3620 Locust Walk
Philadelphia, PA 19104-6372

(215) 746-0125 phone
(215) 898-0401 fax

dhsu@wharton.upenn.edu

David H. Hsu
Richard A. Sapp Professor of Management

April 14, 2016

NBER Productivity, Innovation and Entrepreneurship Program
Call for Research Proposals

Dear Selection Committee:

I have attached a proposal for funding a project entitled "Commercializing Science: Evidence from Simultaneous Discoveries." I would like to apply to both the *Entrepreneurship* area and to the *Innovation Policy* area.

The main idea is that identifying instances of scientific co-discovery provides a quasi-natural laboratory to study a variety of business decisions regarding invention commercialization. More details on the project, which will hopefully lead to more than one research paper, are contained in the attached one-page summary of the project.

A key first step to the project is improving on and expanding an algorithm previously developed by Michael Bikard (faculty at London Business School) to identify scientific co-discoveries. We wish to build our own software so we can control the detailed choices going into the algorithm and to scale up the sample size. The requested funds will also facilitate data collection, analysis & execution beyond the algorithm development stage. Please do not hesitate to contact me with any comments or questions about this submission.

Thank you for your consideration, and best wishes,



David Hsu

Project title: "Commercializing Science: Evidence from Simultaneous Discoveries"

Co-author: Matt Marx (MIT) & others (probably PhD students), TBD.

Brief Project Description: This research project studies two related questions: (1) what shapes the decision to commercialize scientific discoveries, and (2) how does the commercialization strategy of high-technology startups relate to performance outcomes? We address these questions by assembling a relatively large dataset of simultaneous scientific discoveries. Doing so helps us hold constant differences in entrepreneurial opportunities which might otherwise explain the decision to commercialize and/or the performance outcome of commercialization efforts.

With regard to the first research question, the (small) prior literature has mainly studied differences in technological opportunities and characteristics in explaining commercialization decisions of academic inventions. By contrast, we hope to shed light on characteristics *outside* of differences in technological opportunity which might be operating in shaping commercialization. We do so by leveraging the scientific co-discovery dataset to hold constant the technological opportunity, and instead place the spotlight on other variables such as inventor social structure, innovation ecosystem, and academic institutional differences.

Addressing the second research question involves collecting information on the choices associated with new firm formation for the subset of co-discoveries which pursued parallel (but likely different) efforts in enterprise formation to commercialize the academic discovery. One prominent example is the co-discovery of the gene editing tool, CRISPR/Cas9, by a team in Germany (and founders of the startup, CRISPR Therapeutics) and a team at the Broad Institute/MIT/Berkeley (founding Editas Medicine). Taking advantage of the natural variation in resource assembly and strategizing, while holding constant the technological opportunity, is at the heart of the empirical strategy relating entry- and resource assembly- strategy to performance at startups.

Keywords: technology commercialization; strategy; startups.

April 2016

DAVID H. HSU

2028 Steinberg Hall-Dietrich Hall
Wharton School
University of Pennsylvania
Philadelphia, PA 19104

Tel: 215-746-0125
Fax: 215-898-0401
dhsu@wharton.upenn.edu

Citizenship: United States

I. EDUCATIONAL BACKGROUND

Massachusetts Institute of Technology, Sloan School of Management
Ph.D. in Management, September 2001

Harvard University, Kennedy School of Government
Master in Public Policy, June 1996

Stanford University
Bachelor of Arts in Economics and Political Science (with honors), June 1992

II. ACADEMIC EMPLOYMENT

Richard A. Sapp Professor, The Wharton School, University of Pennsylvania, 2015-present

Assistant to Associate Professor of Management (with tenure), The Wharton School, University of Pennsylvania, 2002-15

Post Doctoral Fellow, Sloan School of Management, MIT, 2001-02

Research Associate, Harvard Business School, 1996-97

III. RESEARCH AND PUBLICATIONS

A. Publications

[1] D.H. Hsu and T. Bernstein (1997). "Managing the University Technology Licensing Process: Findings from Case Studies," *Journal of the Association of University Technology Managers*, Vol. 9, pp. 1-33.

[2] J.S. Gans, D.H. Hsu and S. Stern (2002). "When Does Start-up Innovation Spur the Gale of Creative Destruction?" *RAND Journal of Economics*, Vol. 33 (4), pp. 571-586.

[3] D.H. Hsu (2004). "What Do Entrepreneurs Pay for Venture Capital Affiliation?" *Journal of Finance*, Vol. 59 (4), August 2004, pp. 1805-1844.

- Nominated for the 2004 Brattle Prize for best paper in corporate finance published in the *Journal of Finance*.

[4] D.H. Hsu (2004). "Venture Capitalists and Cooperative Start-up Commercialization Strategy," *Academy of Management Best Paper Proceedings*.

[5] D.H. Hsu and M. Kenney (2005). "Organizing Venture Capital: The Rise and Demise of American Research & Development Corporation, 1946-1973," *Industrial and Corporate Change*, Vol. 14 (4), pp. 579-616.

[6] D.H. Hsu (2006). "Venture Capitalists and Cooperative Start-up Commercialization Strategy," *Management Science*, Vol. 52 (2), pp. 204-219.
- Winner of the 2004 Michael H. Mescon/Coles College of Business Award for best empirical paper in the Entrepreneurship Division of the Academy of Management.

[7] D.H. Hsu (2007). "Experienced Entrepreneurial Founders, Organizational Capital, and Venture Capital Funding," *Research Policy*, Vol. 36 (5), pp. 722-741.

[8] D.H. Hsu, E.B. Roberts and C.E. Eesley (2007). "Entrepreneurs from Technology-Based Universities: Evidence from MIT," *Research Policy*, Vol. 36 (2), pp. 768-788.

[9] J.S. Gans, D.H. Hsu and S. Stern (2008). "The Impact of Uncertain Intellectual Property Rights on the Market for Ideas: Evidence from Patent Grant Delays." *Management Science*, Vol. 54 (5), pp. 982-997.
- Finalist (runner-up) for 2013 INFORMS Technology Management best paper award based on papers published in *Management Science* or *Organization Science* five years before.

[10] D.H. Hsu (2008). "Technology-Based Entrepreneurship," in Scott Shane, ed., Handbook of Technology and Innovation Management, Wiley, UK.

[11] D.H. Hsu and R.H. Ziedonis (2008). "Patents as Quality Signals for Entrepreneurial Ventures," *Academy of Management Best Paper Proceedings*.

[12] V.A. Aggarwal and D.H. Hsu (2009). "Modes of Cooperative R&D Commercialization by Start-ups," *Strategic Management Journal*, 30 (8), pp. 835-864.

[13] D.H. Hsu and R.H. Ziedonis (2013). "Resources as Dual Sources of Advantage: Implications for Valuing Entrepreneurial-Firm Patents," *Strategic Management Journal*, 34 (7), pp. 761-781 (lead article).

[14] V.A. Aggarwal and D.H. Hsu (2014). "Entrepreneurial Exits and Innovation," *Management Science*, Vol. 60 (4), pp. 867-887.

[15] D.H. Hsu and K. Lim (2014). "Knowledge Brokering and Organizational Innovation: Founder Imprinting Effects," *Organization Science*, Vol. 25 (4), pp. 1134-1153.

[16] C.E. Eesley, D.H. Hsu and E.B. Roberts (2014). "The Contingent Effects of Top Management Teams on Venture Performance: Aligning Founding Team Composition with Innovation Strategy and Commercialization Environment," *Strategic Management Journal*, 35 (12): 1798-1817.

[17] M. Marx, J.S. Gans and D.H. Hsu (2014). "Dynamic Commercialization Strategies for Disruptive Technologies: Evidence from the Speech Recognition Industry," *Management Science*, 60 (12): 3103-3123.

[18] O. Bengtsson and D.H. Hsu (2015). "Ethnic Matching in the U.S. Venture Capital Market," *Journal of Business Venturing*, 30 (2): 338-354.

[19] M. Marx and D.H. Hsu (2015), "Strategic 'Switchbacks': Dynamic Commercialization Strategies for Technology Entrepreneurs," *Research Policy*, 44 (10): 1815-1826.

B. Papers Under Review and Working Papers

[20] J.T. Fox, D.H. Hsu and C. Yang, "Unobserved Heterogeneity in Matching Games with an Application to Venture Capital" under 2nd review, *Journal of Political Economy*.

[21] C.E. Eesley, D.H. Hsu and E.B. Roberts. "Entrepreneurial Ideation and Organizational Performance: Imprinting Effects".

[22] V.A. Aggarwal, D.H. Hsu and A. Wu, "R&D Production Team Composition and Firm-level Innovation"

C. Work in Progress

I. Barankay, A. Contigiani and D.H. Hsu, "The 'Inevitable Disclosure' Doctrine and Innovation"

S. Chattopadhyay and D.H. Hsu, "Knowledge Distance and Innovation in the Context of Mergers: A Bridge Too Far?"

D.H. Hsu, "University Spinoffs Across the Lifecycle"

D.H. Hsu, A. Kovner J. Lerner & D. Stagg, "Peer Effects and Career Choices"

D.H. Hsu and M. Marx, "Commercializing Science: Evidence from Simultaneous Discoveries"

D.H. Hsu, P.H. Hsu, T. Zhou & A. Ziedonis, "Benchmarking U.S. University Technology Transfer"

D.H. Hsu, P.H. Hsu and Y.T. Lee, "Innovating with Style: Evidence from the S&P 1500"

D. Invited Lectures and Conference Presentations

J.S. Gans, D.H. Hsu and S. Stern, "When Does Start-up Innovation Spur the Gale of Creative Destruction?"

- Harvard Business School Strategy Conference, Boston MA (Oct. 2000)

D.H. Hsu, "The Taiwanese Venture Capital Industry"
- MIT/Academia Sinica Conference, workshop on Networked Production and Globalization, Taipei Taiwan (July 2000)

D.H. Hsu, "The Role of Venture Capitalists in Developing Commercialization Strategies in Start-up Organizations"
- *Academy of Management* Annual Meeting, Toronto Canada (Aug. 2000)

D.H. Hsu, "What Do Entrepreneurs Pay for Venture Capital Affiliation?"
- Duke Univ., Consortium on Cooperation and Competition, Durham NC (April 2001)
- *Academy of Management* Annual Meeting, Washington DC (Aug. 2001)
- NBER Productivity Lunch, Cambridge MA (Oct. 2001)
- Case Western Univ., Management Seminar, Cleveland OH (Oct. 2001)
- Univ. Maryland, Entrepreneurship Seminar, College Park MD (Nov. 2001)
- Boston Univ., Strategy Seminar, Boston MA (Nov. 2001)
- Univ. Pennsylvania, Wharton School, Entrepreneurial Management Seminar, Philadelphia PA (Jan. 2002)
- Columbia Univ., Management Seminar, New York NY (Jan. 2002)
- Carnegie Mellon Univ., Strategy Seminar, Pittsburgh PA (Jan. 2002)
- Univ. Michigan, Strategy Seminar, Ann Arbor MI (Jan. 2002)
- Harvard Business School, Entrepreneurial Management Seminar, Boston MA (Feb. 2002)
- Stanford Univ., Management Science Seminar, Palo Alto CA (Feb. 2002)
- Washington Univ. St. Louis, Strategy Seminar, St. Louis MO (Feb. 2002)
- Univ. Texas, Strategy Seminar, Austin TX (Feb. 2002)
- New York Univ., Management Seminar, New York NY (Feb. 2002)
- INSEAD, Entrepreneurial Management Seminar, Fontainbleau France (Feb. 2002)
- Univ. Toronto, Strategy Seminar, Toronto Canada (Feb. 2002)
- Yale Univ., Entrepreneurship, Venture Capital, and IPO Conference, New Haven CT (April 2002)
- Allied Social Science Alliance Annual Meeting, Washington DC (Jan. 2003)
- Wharton West Conference on Venture Capital, San Francisco CA (May 2004)

D.H. Hsu and M. Kenney, "Organizing Venture Capital: The Rise and Demise of American Research & Development, 1946-1973"
- Univ. Maryland, *Research Policy* Conference, College Park MD (Dec. 2001)
- *Academy of Management* Annual Meeting, Denver CO (Aug. 2002)

D.H. Hsu, "Experienced Entrepreneurial Founders, Organizational Capital, and Venture Capital Funding"
- *Academy of Management* Annual Meeting, Seattle WA (Aug. 2003)
- Univ. Pennsylvania, Wharton School, Reginald Jones Center Lunch, Philadelphia PA (Oct. 2003)
- Rensselaer Polytechnic Institute Scholars' Retreat, Troy NY (Nov. 2003)
- BYU – Univ. Utah Winter Strategy Conference, Salt Lake City UT (March 2004)

D.H. Hsu, "Venture Capitalists and Cooperative Start-up Commercialization Strategy"

- Univ. Pennsylvania, Wharton School, Reginald Jones Center Lunch, Philadelphia PA (April 2004)
- Dartmouth College, Tuck School, Entrepreneurship, Venture Capital, and IPO Conference, Hanover NH (June 2004)
- *Academy of Management* Annual Meeting, New Orleans LA (Aug. 2004)
- Univ. of British Columbia, Strategy and Business Economics Workshop, Vancouver Canada (Nov. 2004)
- Harvard Business School, Entrepreneurship and Innovation Conference, Boston MA (Dec. 2004)

D.H. Hsu and K. Lim, "Knowledge Brokering and Organizational Innovation: Founder Imprinting Effects"

- *Academy of Management* Annual Meeting, New Orleans LA (Aug. 2004)
- Univ. Pennsylvania, Wharton School, Reginald Jones Center Lunch, Philadelphia PA (Oct. 2004)
- Univ. Maryland, Management and Organizations Seminar, College Park MD (May 2005)
- Harvard Business School, Entrepreneurial Management Seminar, Boston MA (May 2005)
- UCLA/Oxford Entrepreneurship Conference, Los Angeles CA (June 2005)
- Univ. Washington/Stanford Univ. - West Coast Research Symposium on Technology Entrepreneurship, Seattle WA (Sept. 2005)
- MIT Sloan, Entrepreneurship and Innovation Seminar, Cambridge MA (Nov. 2005)
- Northwestern Univ., Entrepreneurship Seminar, Evanston IL (May 2006)
- Univ. Southern California, Strategy Seminar, Los Angeles CA (Nov. 2006)

D.H. Hsu, E.B. Roberts and C.E. Eesley, "Entrepreneurs from Technology-Based Universities: Evidence from MIT"

- *Academy of Management* Annual Meeting, Honolulu HI (Aug. 2005)
- NBER Entrepreneurship Group Fall Meeting, Cambridge MA (Oct. 2005)

J.S. Gans, D.H. Hsu and S. Stern, "The Impact of Uncertain Intellectual Property Rights on the Market for Ideas: Evidence from Patent Grant Delays"

- Univ. Pennsylvania, Wharton School, Bowman Brownbag seminar series, Philadelphia PA (March 2006)
- George Mason, George Washington, and Georgetown Joint Seminar on Technology Policy, Washington DC (Sept. 2006)
- London School of Economics, RICAFE2 Conference, London England (Oct. 2006)
- Univ. California-Berkeley, Institutional Analysis Workshop, Berkeley CA (Nov. 2006)
- *Academy of Management* Annual Meeting, Philadelphia PA (Aug. 2007)

V.A. Aggarwal and D.H. Hsu, "Modes of Cooperative R&D Commercialization by Start-ups"

- London Business School Entrepreneurship Conference, London England (May 2006)
- Schumpeter Society Conference, Sophia-Antipolis France (June 2006)

- *Academy of Management* Annual Meeting, Atlanta GA (Aug. 2006)
- Univ. Washington/Stanford Univ. - West Coast Research Symposium on Technology Entrepreneurship, Seattle WA (Sept. 2006)

D.H. Hsu and R.H. Ziedonis, "Resource as Sources of Dual Advantage: Implications for Valuing Entrepreneurial-Firm Patents" (Formerly titled: "Patents as Quality Signals for Entrepreneurial Ventures")

- Univ. Pennsylvania, Wharton School, Bowman Brownbag Seminar, Philadelphia PA (April 2007)
- London Business School Entrepreneurship Conference, London England (April 2007)
- Univ. Chicago, Organizations and Markets Workshop, Chicago IL (May 2007)
- Stanford Univ., Stanford Technology Venture Partners Workshop, Stanford CA (May 2007)
- UCLA, Strategy and Policy Seminar, Los Angeles CA (May 2007)
- Danish Research Unit on Industrial Research (DRUID) Summer Conference (Plenary Speaker), Copenhagen Business School, Copenhagen Denmark (June 2007)
- Duke Univ., Strategy Seminar, Durham NC (Sept. 2007)
- NBER Entrepreneurship Group Fall Meeting, Cambridge MA (Oct. 2007)
- Univ. Toronto, Strategy Seminar, Toronto ON (Nov. 2007)
- London Business School, Entrepreneurship Seminar, London England (Nov. 2007)
- Cornell Univ., Applied Economics Workshop, Ithaca NY (Nov. 2007)
- New York Univ., Strategy Seminar, New York NY (Nov. 2007)
- *Academy of Management* Annual Meeting, Anaheim CA (Aug. 2008)

O. Bengtsson and David H. Hsu, "Ethnic Matching in the U.S. Venture Capital Market" (Formerly titled: "How do Venture Capital Partners Match with Startup Founders?")

- Univ. North Carolina – Chapel Hill, Chapel Hill NC (Nov. 2008)
- *Academy of Management* Annual Meeting, Chicago IL (Aug. 2009)
- Entrepreneurial Finance and Innovation Conference (*Review of Financial Studies* special issue conference), Boston MA (June 2010)

D.H. Hsu and A. Marino, "Organizational Routines Development and New Venture Performance"

- Darden Entrepreneurship and Innovation Conference, Univ. Virginia, Charlottesville VA (April 2010)
- Drexel Univ., Strategy Seminar, Philadelphia PA (May 2010)
- Atlanta Competitive Advantage Conference, Atlanta GA (May 2010)

V.A. Aggarwal and D.H. Hsu, "Entrepreneurial Exits and Innovation"

- NBER Productivity Lunch, Cambridge MA (Sept. 2010)
- Research Institute of Industrial Economics (IFN) Conference on Entrepreneurship, Firm Growth and Ownership Change, Stockholm Sweden (June 2011)
- Entrepreneurial Finance Conference, Tilburg Univ., Tilburg Netherlands (Nov. 2011)
- UCLA, Entrepreneurship and Innovation Seminar, Los Angeles CA (Dec. 2011)
- Temple Univ. – Fox School Workshop, Philadelphia PA (February 2012)

- Economics of Entrepreneurship and Innovation Conference, Queen's Univ., Kingston ON (June 2012)
- Stanford Institute for Economic Policy Research (SIEPR) Innovation Seminar, Palo Alto CA (Sept. 2012)
- UCSD, Information, Technology & Operations Management Seminar, La Jolla CA (May 2013)

C.E. Eesley, D.H. Hsu and E.B. Roberts, "The Contingent Effects of Top Management Teams on Venture Performance: Aligning Founding Team Composition with Innovation Strategy and Commercialization Environment" (Former title: "Bringing Entrepreneurial Ideas to Life")

- *Academy of Management* Annual Meeting, San Antonio TX (Aug. 2011)

M. Marx, J.S. Gans and D.H. Hsu, "Dynamic Commercialization Strategies for Disruptive Technologies: Evidence from the Speech Recognition Industry" (Former title: "Technology Commercialization Strategy Dynamics and Entrepreneurial Performance: Evidence from the Speech Recognition Industry")

- Georgia Tech, Strategy Seminar, Atlanta GA (March 2012)
- Wharton School, University of Pennsylvania, Bowman Seminar, Philadelphia PA (March 2012)
- London Business School, Ghoshal Conference, London UK (May 2012)
- *Academy of Management* Annual Meeting, Boston MA (Aug. 2012)
- Stanford, Management Science Seminar, Palo Alto CA (Nov. 2013)

M. Marx and D.H. Hsu, "Strategic 'Switchbacks': Dynamic Commercialization Strategies for Technology Entrepreneurs"

- Univ. Colorado, Front Range Management Research Seminar, Boulder, CO (Feb. 2014)
- BYU - Univ. Utah Strategy Conference, Park City UT (March 2014)
- London Business School, Strategy Seminar, London UK (April 2014)
- Copenhagen Business School, Copenhagen Denmark (April 2014)
- INSEAD, Entrepreneurship Seminar, Fontainebleau France (April 2014)
- Columbia Business School, Management Seminar, New York NY (Dec. 2014)
- Harvard Business School, Technology and Operations Management Seminar, Boston MA (May 2015)

V.A. Aggarwal, D.H. Hsu and A. Wu, "R&D Production Team Composition and Firm-level Innovation"

- *Academy of Management* Annual Meeting, Philadelphia PA (Aug. 2014)
- *Strategic Management Society* Annual Meeting, Madrid, Spain (Sept. 2014)
- West Coast Research Symposium on Technology Entrepreneurship, Seattle WA (Sept. 2015)

I. Barankay, A. Contigiani and D.H. Hsu, "The 'Inevitable Disclosure' Doctrine and Innovation"

- Wharton School, Univ. Pennsylvania, Work in Progress Seminar (Dec. 2014)
- Univ. of Hong Kong, Strategy and Economics Seminar, Hong Kong (March 2015)
- National Univ. of Singapore, Management Seminar, Singapore (March 2015)

- Univ. California-Berkeley, Innovation Seminar, Berkeley CA (April 2015)
- Univ. Michigan, Strategy Seminar, Ann Arbor MI (April 2015)
- Univ. Florida, Strategy Seminar, Gainesville FL (Jan. 2016)
- Duke Univ., Strategy Seminar, Durham NC (April 2016)
- Boston Univ., Strategy Seminar, Boston MA (April 2016)
- Univ. Maryland, Management Seminar, College Park MD (May 2016)

E. Invited Discussions

Management Science Conference on University Entrepreneurship and Technology Transfer, Atlanta GA (Dec. 2000)

Kennedy School of Government, Harvard Univ., "Between Invention and Innovation: Mapping the Funding for Early Stage Technology Based Innovation" workshop, Cambridge MA (May 2001)

Wharton Conference on Market Strategy and the Business Environment, Philadelphia PA (March 2004)

Georgia Tech Roundtable for Engineering Entrepreneurship Research, Atlanta GA (Dec. 2004)

American Economics Association Annual Meeting, Washington DC (Jan. 2005)

Penn Economic History Forum, Univ. Pennsylvania, Philadelphia PA (Jan. 2005)

Western Finance Association Annual Meeting, Portland OR (June 2005)

"Joint Knowledge Creation and Sharing" paper session, *Academy of Management* Annual Meeting, Honolulu HI (Aug. 2005)

Georgia Tech Roundtable for Engineering Entrepreneurship Research, Atlanta GA (Dec. 2006)

Univ. Amsterdam conference on "Innovation and Early Stage Ideas," discussion leader on "Movement of Ideas and Movement of People," Amsterdam Netherlands (Dec. 2006)

International Motor Vehicle Program – Automotive Mini-conference at Wharton, Philadelphia PA (June 2007)

Danish Research Unit on Industrial Dynamics (DRUID) conference, "Entrepreneurship" session, Copenhagen Business School, Copenhagen Denmark (June 2007)

"Use of Patent Data in Management Research," Professional Development Workshop, *Academy of Management* Annual Meeting, Philadelphia PA (Aug. 2007)

"Entrepreneurship Research" Professional Development Workshop, *Academy of Management* Annual Meeting, Philadelphia PA (Aug. 2007)

West Coast Research Symposium on Technology Entrepreneurship, "Strategies for Entrepreneurial Fundraising" session, Seattle WA (Sept. 2007)

NBER / *Journal of Economics and Management Strategy* Entrepreneurial Strategy and Structure Conference, Jackson Hole WY (Sept. 2007)

"Markets for Technology" in European Institute for Advanced Studies in Management workshop on Co-opetition at Universidad Carlos III de Madrid (Feb. 2008)

Economics of Entrepreneurship and Innovation Conference, Queen's Univ., Kingston ON (June 2008)

Entrepreneurship Workshop, Univ. Michigan, Ann Arbor MI (July 2008)

"Financing Strategies for New Ventures" paper session, *Academy of Management* Annual Meeting, Anaheim CA (Aug. 2008)

"Entrepreneurship and Venture Capital" paper session, Wharton Technology Conference, Philadelphia PA (April 2009)

Entrepreneurship Conference, Univ. Maryland, College Park MD (April 2010)

Entrepreneurial Finance and Innovation Conference (*Review of Financial Studies* special issue conference), Boston MA (June 2010)

NBER Summer Institute, Entrepreneurship Program, Boston MA (July 2010)

"Technology Entrepreneurship" session, MIT Sloan Technological Innovation, Entrepreneurship and Strategic Management Group 50th Anniversary Research Conference, Boston MA (April 2011)

Darden Entrepreneurship and Innovation Research Conference, Univ. Virginia, Charlottesville VA (May 2011)

Research Institute of Industrial Economics (IFN) Conference on Entrepreneurship, Firm Growth and Ownership Change, Stockholm Sweden (June 2011)

Wharton Technology Conference, Philadelphia PA (April 2012)

Patents, Entrepreneurship and Innovation / *Journal of Industrial Economics* Conference, Washington DC (May 2012)

"Crowdsourcing Innovation" session, INSEAD Innovation Research Conference, Fontainebleau, France (May 2012)

Entrepreneurial Finance and Innovation Conference (parallel submission to *Review of Financial Studies* conference), Boston MA (June 2012)

NBER Entrepreneurship Working Group Winter Meeting, Cambridge MA (Dec. 2012)

Wharton Technology Conference, Philadelphia PA (April 2013)

Kauffman Foundation conference on crowdfunding (keynote speaker), Boulder CO (July 2013)

NBER Economics of Intellectual Property Summer Institute Meeting, Cambridge MA (July 2013)

"Entrepreneurial Technology Commercialization Strategies: Past and Future Research," INFORMS Technology Management Section Best Paper Winner Presentation, 2013 INFORMS Annual Meeting, Minneapolis MN (Oct. 2013)

NBER Conference on the Changing Financing Market for Entrepreneurship and Innovation, Half Moon Bay CA (Nov. 2013)

"New Venture Development" paper session, Wharton Technology and Innovation Conference, Philadelphia PA (April 2014)

"Origins and Outcomes of Entrepreneurs' Network Ties" paper session, *Academy of Management* Annual Meeting, Philadelphia PA (Aug. 2014)

"Entrepreneurship Policy and Strategy" paper session, *Academy of Management* Annual Meeting, Philadelphia PA (Aug. 2014)

Georgia Tech Roundtable for Engineering Entrepreneurship Research, Atlanta GA (Nov. 2014)

"Intellectual Property Statistics for Decision Makers" EPO/OECD conference, Vienna, Austria (Nov. 2015)

University of Virginia Darden / Cambridge University Judge Entrepreneurship & Innovation Research Conference, Washington DC (May 2016)

F. Editorial Activities

Editor

Management Science

- Entrepreneurship and Innovation department, 2011-14

Associate Editor

Management Science

- Entrepreneurship and Innovation department, 2006-10
- Organizations and Social Networks department, 2006-08

Editorial Boards

- *Strategic Management Journal*, 2013-present
- *Journal of Business Venturing*, 2016-present

Ad hoc Referee

Academy of Management Annual Meetings; *Academy of Management Journal; Academy of Management Review; Administrative Science Quarterly; Advances in Strategic Management; American Economic Review; California Management Review;* Cambridge University Press; *Economic Journal; Economics Letters; European Management Review; Journal of Business Venturing; Journal of Economic Behavior and Organization; Journal of Economics and Management Strategy; Journal of Finance; Journal of Financial Economics; Journal of Financial Intermediation; Journal of International Business Studies; Journal of Law, Economics, and Organization; Management Science;* MIT Press; National Science Foundation; *Nature; Organization Science;* Oxford University Press; *RAND Journal of Economics; Research Policy; Review of Economics and Statistics; Review of Industrial Organization; Social Forces; Strategic Entrepreneurship Journal; Strategic Management Journal;* Wharton Business School Press; Yale University Press

G. Research Interests

Entrepreneurial innovation and management

IV. TEACHING ACCOMPLISHMENTS

A. Course Created/Developed and Taught

Management 731, Technology Strategy (MBA), 2004-08
Management 801, Entrepreneurship (MBA/WEMBA), 2003-present
Management 612, Managing the Emerging Enterprise (Core MBA), 2013-present
Management 893, Global Modular Course in Israel (MBA/WEMBA), 2013-present
Management 939, Entrepreneurial Innovation (PhD), 2014-present

B. Teaching Interests

Managing technological innovation; entrepreneurial management and strategy

V. PROFESSIONAL ACTIVITIES

A. University-Related Activities

1. Committee membership

Member, Mack Chair in Management of Technology search committee, Management Department, Wharton School, Univ. Pennsylvania, 2003

Member or Chair, Junior Faculty Search Committees, Entrepreneurial Management Group & Strategic Management Group, Management Department, Wharton School, Univ. Pennsylvania, 2003-present

Member, Undergraduate Curriculum Committee, Management Department, Wharton School, Univ. Pennsylvania, 2007-08

Member, MBA and Undergraduate Curriculum Committee, Wharton School, Univ. Pennsylvania, 2008-09

Chair, Academic Seminar Restructuring Committee, Management Department, Wharton School, Univ. Pennsylvania, 2008-09

Member, Ad Hoc Personnel Committees, Management Department, Wharton School, Univ. Pennsylvania, 2010-present

Member, Doctoral Committee, Management Department, Wharton School, Univ. Pennsylvania, 2010-15

Member, MBA Executive Committee, Wharton School, Univ. Pennsylvania, 2010-11; 2014-15

Member, Penn Fulbright Committee, Univ. Pennsylvania, 2013-14

Member, Penn Faculty Innovation Council Committee, Univ. Pennsylvania, 2013-14

Member, Penn University Council Committee on Academic and Related Affairs, Univ. Pennsylvania, 2014-15

Member, Analytics Initiative Committee, Wharton School, Univ. Pennsylvania, 2015-16

2. Advising

Doctoral Thesis Committee Advisor or Co-Advisor

- V. Aggarwal, Management Department, Wharton School (2004-09). Initial placement: INSEAD, Fontainbleau France
- A. Wu, Business Economics and Public Policy Department, Wharton School (2011-16). Initial placement: Harvard Business School, Boston, MA
- A. Contigiani, Management Department, Wharton School (2013-present).
- K. Myers, Health Care Management Department, Wharton School (2016-present).

Doctoral Thesis Committee Membership

- P. Banerjee, Management Department, Wharton School (2003-05, initial placement: University of Illinois-Urbana Champaign)
- E. Alvarez-garrido, Management Department, Wharton School (2007-10, initial placement: Georgia State University)
- P. Wibbens, Management Department, Wharton School (2016-present)

3. Other university activities

Organizer, Wharton Management of Technology Research Seminar Series, 2003-06

Co-organizer, Wharton Technology Research Mini-conference, 2005-08

Reviewer, Wharton doctoral student second year paper presentations, occasional

Advisory Board, Pan-Asian American Community House, Univ. Pennsylvania, 2005-08

MBA Pre-term course faculty, 2003-11

Executive Masters in Technology Management (EMTM) program, occasional course instructor, 2004-14

Associate Faculty Director, Weiss Tech House, Univ. Pennsylvania, 2008-present

Academic Director, Wharton Global Initiatives - Guanghua Business School, EMBA program, Aug. 2011

Co-founder and co-organizer, Penn Y-Prize competition (yprize.upenn.edu), 2012-present

Wharton entrepreneurship & innovation academic area coordinator, 2015-present.

B. Non-University Related Academic Activities

Participant, U.S. Senate Committee on Small Business forum, "Encouraging and Expanding Entrepreneurship: Examining the Federal Role," March 2001

Doctoral Student Consortium Faculty Leader, Technology and Innovation Management (TIM) division of the Academy of Management, Atlanta GA, 2006

Doctoral Student Workshop Faculty, IRI Summer School on "Individual and Corporate Entrepreneurship in High-Tech Industries," Volterra Italy, June 2006

Representative-at-Large (elected) to the Executive Committee in the Technology and Innovation Management (TIM) division of the Academy of Management, 2007-09

Participant, U.S. National Academy of Sciences' Science, Technology and Economic Policy (STEP) Board meeting on "Investor Exits: Implications for Innovation and Entrepreneurship in the United States Economy," Washington DC, Aug. 2007

Reviewer, *Organization Science* doctoral dissertation proposal competition, Fall 2007

Doctoral Student Workshop Faculty, West Coast Research Symposium on Technology Entrepreneurship, Seattle WA, Sept. 2007

Program Committee, Regional Comparative Advantage and Knowledge-Based Entrepreneurship (RICAFE2) conference funded by the European Commission, Riga Latvia, Oct. 2007

Program Committee, Harvard Business School Entrepreneurship Research Conference, Boston MA, Dec. 2007

Representative-at-Large (elected) to the Executive Committee in the Entrepreneurship & Strategy Interest Group of the Strategic Management Society, 2008-10

Organizer, Strategic Management Society session on "Key Issues in Entrepreneurial Strategy Research," Washington DC, Oct. 2009

Member, Strategy Research Foundation of the Strategic Management Society (SMS) Grants Committee (appointed), 2010-present

Participant, White House Office of Science & Technology Policy forum, "Evaluating the Small Business Innovation Research (SBIR) Program," Washington DC, May 2013

C. Professional Affiliations and Memberships

Academy of Management; American Economics Association; Strategic Management Society; Strategy Research Initiative

VI. GRANTS, HONORS AND AWARDS

Outstanding master's thesis on commercializing university technologies, Harvard Univ., Kennedy School of Government, 1996

MIT Sloan School Fellowships: David & Lindsay Morgenthaler Fellowship; CS Holding Doctoral Fellowship; and Wilson Fellowship, 1997-2001

Edward B. and Shirley R. Shils Term Assistant Professor of Management, The Wharton School, Univ. of Pennsylvania, 2002-08

Mack Institute for Innovation Management at Wharton, research grants: 2002-present

Alfred P. Sloan Industry Studies Fellowship ($45,000), 2008-09

Management Science Meritorious Service Award, 2010

Richard A. Sapp Associate Professor, The Wharton School, Univ. of Pennsylvania, 2010-15

VII. PERSONAL

Married; Two children born 12/2007 and 9/2009