Project Title:

Technological Distance, Geographical Proximity, and Innovation Policy: An Empirical Study of the Emerging Sectors

Researchers:

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Documents:

1. Proposal
2. References of the proposal
3. Budget estimation and justification
4. CVs

Technological Distance, Geographical Proximity, and Innovation Policy: An Empirical Study of the Emerging Sectors

1. Introduction and Literature Review

The proposed project analyzes technological distance, geographical proximity, and innovation policy that take place in a sectoral innovation system and knowledge network in the emerging sectors with the aim of identifying the implications of these dynamics for policies and institutions in the decades ahead. These innovation networks are linked to institutions and innovation policy within the system. Innovations, especially in the emerging high-tech sector, rely primarily on collaboration between actors in the innovation networks (Bougrain and Haudeville 2002). In this project, we explore how technological distance and geographical proximity contribute to the formation of collaboration and how can technology policy stimulate collaborations.

Emerging technologies are new technologies in the process of development. While combining with the innovative entrepreneurs and supportive institutional settings, emerging technologies have high potential to generate economic growth and change the societies (Freeman and Louçã 2001; Hopkins and Siepel 2013; Rotolo et al. 2015). For this reason, emerging technologies have been the main subjects of many policy debates worldwide (Rotolo et al. 2015).

Innovation is an interactive process in which the networks between local actors and connection with externally generated knowledge are particularly important. The networks that arise in this process have become the focus of many recent empirical studies. Among other things, the results of these studies indicate that innovation systems perform much better when there is relational heterogeneity – that is, a mix of internal interaction and external relations. However, the existing literature is deficient concerning an understanding of dynamics within these systems as well as how changes in some sub-systems might affect other elements of the system. For example, what are the roles of particular actors within an innovation system in structuring change over time? How do these alliances affect innovation policies? In particular, how could dynamics in policy and the institutional framework affect innovation within networks?

This proposed project considers the foregoing questions in the case of the emerging sectors. Over the last three decades, promoting emerging sectors has been a major focus of government policy in most of the countries. Consequently, the establishment of new R&D firms has been enhanced but previous studies have shown that clear results regarding new products and technologies have not been achieved. The possible long-term impacts on system dynamics that the interventions might have caused have also been mostly ignored. In this proposed project, we focus on how technological distance and geographical proximity contribute to the formation of collaboration and how they affect innovation networks within the emerging sectors over time.

2. Methodology and Timeline

This project focuses on two emerging sectors, biotechnology, and artificial intelligence. A central hypothesis was made to answer the research questions mentioned above: How do technological distance and geographical distance contribute to the formation of networks and how can technology policy stimulate collaborations.

A. **Data Collection (July to September, 2018).** To addressing our research questions, we have to compile a dataset that describes the collaboration among the actors in our target sectors. We use two databases highlighted in Schilling's study (Schilling 2009), SDC and RECAP. SDC tracks cooperative agreements involving licensing, R&D and more. SDC database covers a wide range of sectors, collecting agreements

between industrial partners, universities and government labs, or any combination thereof. RECAP is another commercial database that collects alliance information, specializing in the biotech sector. It collects data from three primary sources: biotechnology and pharmaceutical company press releases and other literature; SEC filings; and company presentations made at investment conferences and other public meetings (Schilling 2009). At this stage, the first researcher of this project will be a visiting fellow at the Woodrow Wilson International Center for Scholars based in Washington DC. A US-based student will be hired to assist in data collection and data processing.

B. **Data Processing (October to December, 2018).** Among existing literature, the commonly established factors affecting collaboration partner selections include technological proximity (Boschma 2005; Cantner and Meder 2007) and geographical proximity (Howells 2002). However, what is less clear is how do technological distance and geographical proximity enhance the collaborations in emerging high-tech sectors? This project examines the collaboration network of selected sectors to explore the associations that technological distance and geographical distance brought to enhance the formation of innovation networks. We would like to answer the following research question; do the technological distance and geographical proximity of the actors affect the collaborations in the innovation networks? We have calculated the geographical distance between each set of collaborating actors by using the Google Map API. The calculation of the technological distance between entities is less intuitive; we drew insights from previous studies (Bar and Leiponen, 2012) to identify proxies for technological distance and will develop computer routines to calculate it.

C. **Preliminary Data Analysis and Presentation (January to February, 2019).** By early 2019, we will be ready to direct our primary efforts into analyzing a rich set of data to identify the different network models of research collaborations in the field of biotechnology and artificial intelligence. This will provide deeper insights into the contexts and consequences of the collaborations and their associations with the proximity of the actors. The preliminary result will be presented at 2019 AAAS Annual Meeting in Washington DC.

D. **Reporting and Closing (March to June, 2019).** By June 2019, a major research monograph will be written as the primary product of this proposed project. The collected dataset and analysis of this project could contribute to proposed tailor-made innovation policies to enhance R&D collaborations nationally and internationally.

3. Anticipate Results and Potential Policy Implication

This proposed research project will shed light on developing emerging technology through a comprehensive study of the innovation network in the field biotechnology and artificial intelligence. We attempt to develop a new set of measurements to conducting an in-depth study of the networks in a system, and how they have developed over time, with an analysis of the institutional factors (e.g., policy) which influence the network formation in the emerging sectors. The proposed research approaches in this proposed project will be transferable to the studies in relation to the emergence of new technologies in and beyond emerging economies across multiple scientific disciplines. A major research monograph will be written as the primary product of this proposed project. The main audience for the research outcomes will be the policymakers, scholars, technology managers, and venture capitalists who are interested in strategic alliance and R&D collaborations in the emerging sectors.

References:

1. Bougrain, F., & Haudeville, B. (2002). Innovation, collaboration and SMEs internal research capacities. Research policy, 31(5), 735-747.
2. Freeman, C., & Louça, F. (2001). As time goes by: the information revolution and the industrial revolutions in historical perspective. Oxford University Press.
3. Hopkins, M. M., & Siepel, J. (2013). Just how difficult can it be counting up R&D funding for emerging technologies (and is tech mining with proxy measures going to be any better)?. Technology Analysis & Strategic Management, 25(6), 655-685.
4. Rotolo, D., Hicks, D., & Martin, B. R. (2015). What is an emerging technology?. Research Policy, 44(10), 1827-1843.
5. Schilling, M. A. (2009). Understanding the alliance data. Strategic Management Journal, 30(3), 233-260.
6. Boschma, R. (2005). Proximity and innovation: a critical assessment. Regional studies, 39(1), 61-74.
7. Cantner, U., & Meder, A. (2007). Technological proximity and the choice of cooperation partner. Journal of Economic Interaction and Coordination, 2(1), 45-65.
8. Howells, J. R. (2002). Tacit knowledge, innovation and economic geography. Urban studies, 39(5-6), 871-884.
9. Bar, T., & Leiponen, A. (2012). A measure of technological distance. Economics Letters, 116(3), 457-459.

Item	Funds requested by proposer
Personnel	$1,400
Travel	$6,980
Database	$11,000
Miscellaneous	$620
Total	$20,000

A. Personnel:

From July to August 2018, the first researcher of this project will act as a visiting fellow at the Woodrow Wilson International Center for Scholars based in Washington DC. An US-based student will be hired through researchers' connections with Woodrow Wilson International Center for Scholars to assist in data collection and data processing (e.g. categorizing and cleaning alliance data from the commercial databases). This part-time research assistant will be paid $14.00/hour for 20 hours of work per week for 5 weeks, 100 hours in total.

Personnel Subtotal: $1,400

B. Travel—International:

Two researchers in this project will present the preliminary research outcome of this project at the 2019 AAAS Annual Meeting, which will be held in Washington DC, from February 14 to18, 2019. Registration expenses are estimated at $440 per person (according to the registration fee of 2018 annual meeting). Travel expenses include economy class, round trip tickets from Taipei, Taiwan to Washington DC, USA, estimated at $1,600 per person. Per Diem rate for Washington DC area is around $290 per day, according to GSA (https://www.gsa.gov/travel/plan-book/per-diem-rates/per-diem-rates-lookup/?action=perdiems_report&state=DC&fiscal_year=2018&zip=20036&city=).

Travel Subtotal: $6,980 (440*2+1600*2+290*5*2)

C. Database License Purchase :

The Thomson Reuters Joint Venture & Strategic Alliances database tracks cooperative agreements by two or more separate entities that may result in the formation of a third entity,

either as a start-up or through the merger of assets, or acquisition of stakes; as well as agreements involving licensing, manufacturing, research and development, mining & exploration, supply services. Dating back to 1985, Thomson Reuters JVs & Alliances covers over 59,000 formal Joint Ventures and 79,000 Strategic Alliances – amounting to over 138,000 partnerships in total.

Database Subtotal: $11,000

D. Miscellaneous expense:

Include Publication, Documentation, Computer Services, Materials and Supplies and other direct costs.

Subtotal: $ 620

Total $20,000

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EDUCATION

PhD July 2007	**National Chiao Tung University** Institute of Information Management	HsinChu, Taiwan
Exchange Program 2005-2006	**National Science Foundation for PhD Student International Scholarly Exchange (NSC-094-2917-I-009-016)**	Georgia, USA
BSc June 1999	**Chung Hua University** Department of Information Management	HsinChu, Taiwan

PROFESSIONAL EXPERIENCE

2008- now **Assistant Professor**
Department of Innovative Information and Technology, Tamkang University, Taiwan

2007-2008 **Assistant Professor**
Department of Information Management, Chien Hsin University of Science and Technology

SCHOLARLY WORK

Journal Articles

- Feng-Cheng Chang, Duen-Kai Chen, Hsiang-Cheh Huang (2015, Sep). Future Classroom with the Internet of Things – A Service-Oriented Framework. Journal of Information Hiding and Multimedia Signal Processing, Volume 6, No. 5, pp. 869-881. (EI)
- Chen, S-H., Egbetokun, A.A. and Chen, D-K (2015, Feb). Brokering knowledge in networks: institutional intermediaries in the Taiwanese biopharmaceutical innovation system. International Journal of Technology Management. (SSCI/SCI)
- Duen-Kai Chen; Feng-Cheng Chen; Szu-Yin Lin (2014, Jun). A location-based context-aware service discovery approach for cycling experience. International Journal of Ad Hoc and Ubiquitous Computing , 16(2), pp.125-135. (SCI)
- Duen-Kai Chen (2013, Jan). Data Mining Based Intelligent System for Voting Behavior Analysis. Applied Mechanics and Materials (Innovation for Applied Science and Technology), Vols. 284-287, pp 3070-3073.

Conferences

Conference Papers

- Chen, Shih-Hsin; Lin, Wei-Ting; Chen, Duen-kai (2017, May). Geographical Proximity and Inter-firm R&D Networks in the Taiwanese Biotechnology Sector. 2017 Industry Studies Conference, Washington DC, USA.
- Huang-Wen Huang, In-Ho Lin, Duen-Kai Chen, Min-Lun Jen and Xiang-Yun Chen (2014, Dec). A Fast Adaptive Power Scheme with Different Heating Modes for Optimal Hyperthermia Treatment.
- Chen, Shih-Hsin, Egbetokun, Abiodun and Chen, Duen-Kai, *Brokerage Role of Intermediaries in Innovation Networks: the Biopharmaceutical Innovation System in Taiwan*, 3rd Global Tech Mining Conference, September 25, 2013, Atlanta, Georgia, USA
- Duenkai Chen (2012, Jul). A Context-aware Recommender System for Web Service Composition. The Eighth International Conference on Intelligent Information Hiding and Multimedia Signal Processing, Piraeus-Athens, Greece
- Feng-Cheng Chang, Duen-Kai Chen (2011, Oct). The Design of an XMPP-based Service Integration Scheme. Intelligent Information Hiding and Multimedia Signal Processing (IIH-MSP), 2011 Seventh International Conference on, Dalian, China..
- Chen, Duen-Kai, Chen, Shih-Hsin and Teng, Pei-Lun, *Issues Concerning Patients' Privacy Rights under E-health Era in Taiwan's Legal Regime*, International Congress on Medical Law, August 15, 2005, Seoul, Korea
- Chen, Duen-Kai and Chen, Shih-Hsin, *E-Health in Taiwan: Law and Regulatory Perspective*, The 3rd International Conference on Politics and Information Systems: Technologies and Applications (PISTA'05), July 2005, Orlando, Florida, USA
- Chen, Shih-Hsin and Chen, Duen-Kai, *Law and Regulatory Perspective of Gene Flow*, In re StarLink and Monsanto Canada, Inc. v. Percy Schmeiser, et al., 8th National Technology Law Conference, 2004, Shin-Chu, Taiwan (in Chinese)

Conference Presentations

- Chen, Shih-Hsin; Lin, Wei-Ting; Chen, Duen-kai (2017,October). Analyzing the Cluster Effects on Biotechnology Innovation Networks in Taiwan, Atlanta Conference on Science and Innovation Policy, October 9-11, 2017 Atlanta, Georgia, USA
- Chen, Shih-Hsin; Lin, Wei-Ting; Omobhude, Christian; Chen, Duen-Kai (2017, April). The Mutual Shaping of RD networks and Social Technical Transitions in East Asian Digital Economies. 2017 AAG Annual Meeting, Boston, MA, USA.
- Chen, Shih-Hsin ;Lin, Wei-Ting;Chen, DuenKai (2016, Nov). University R&D Collaborations in the Biotechnology Innovation System. 2016 Technology Transfer Society (T2S) Conference Beyond formal university technology transfer: Innovative mechanisms for the exchange of new knowledge , November 3-5, 2016, Phoenix, AZ, USA
- Chen, Shih-Hsin, Lin Wei-Ting, and Chen, Duen-Kai, *The Emergence of Innovation Networks in an Emerging Biotechnology Sector: The Case of Taiwan*, Business Networks session of Sunbelt XXXVI Conference, 5-10 April 2016, Newport Beach, CA, USA

Conference Posters

- Chen,Shih-Hsin, Chen, Duen-Kai, and Lin, Wei-Ting *The Key Factors of Establishing R&D Collaboration in an Emerging High-Tech Sector*, Atlanta Conference on Science and Innovation Policy, September 17-19 , 2015, Atlanta, Georgia, USA
- Chen, Duen-Kai , Chen, Shih-Hsin, Lin, Wei-Ting and Chiu, Yao-Ching, Hybrid of Agent-Based Modelling Simulation with Social Network Analysis for Innovation Study, 5th Global Tech Mining Conference, September 16, 2015, Atlanta, Georgia, USA
- Chen, Duen-Kai, and Chen, Shih-Hsin, Brokering Knowledge in Innovation Networks: an Agent-Based Modelling Simulation Approach, AAAS Conference February 12-15, 2015, San Jose, California, USA
- Chen,Shih-Hsin and Chen, Duen-Kai, *Developing Knowledge Transfer and the Biopharmaceutical Research Collaboration in the Innovation System of Taiwan*, Atlanta Conference on Science and Innovation Policy, Atlanta, Georgia, USA
- Chen, Shih-Hsin, *Ethical, Legal and Social Issues (ELSI) in the Studies of Biopharmaceuticals Innovation System*, 2011 ELSI Congress, April 12-14, 2011, Chapel Hill, USA
- Chen, Shih-Hsin and Chen, Duen-Kai, Privacy, Public health, and the Electronic Patient Records: A Comparative Analysis of the Laws of Taiwan and the US; the Public's Health and the Law in the 21st Century, Fifth Annual Partnership Conference, June 12-14, 2006, Atlanta, USA

PROFESSIONAL SERVICE

Reviewer

Computers & Industrial Engineering

Journal of Information Science and Engineering

Electronic Commerce Research and Applications

Progress in Artificial Intelligence

Asian Journal of Control

International Journal of Automation and Computing

Mathematical Problems in Engineering

Pacific Asia Conference on Information Systems (PACIS2016)

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EDUCATION

PhD March 2014	**University of Nottingham** Institute for Science and Society Thesis: Knowledge Transfer and Innovation Networks in the Biopharmaceuticals Innovation System	Nottingham, UK
Master of Law July 2004	**National Tsing Hua University** Institute of Law for Science and Technology Thesis: The Study of Liability Concerning Gene Flow of Genetic Modified Plants	HsinChu, Taiwan
BSc June 2001	**National Taiwan University** Department of Life Science	Taipei, Taiwan
Special Standing Graduate Student August 2005-2006	**Emory University** Rollins School of Public Health Courses Taken: Fundamentals of Public Health Law (HPM 561); Interdisciplinary Perspective of Human Rights (GH 590R)	Atlanta, Georgia, USA

PROFESSIONAL EXPERIENCE

2018 Jan-May **Visiting Fellow- Working with Dr. Richard Bush**
Center for East Asia Policy, The Brookings , Washington DC, USA

2014- now **Assistant Professor**
Institute of Management of Technology, College of Management, National Chiao Tung University, Hsin-Chu, Taiwan (AACSB Accredited Institution)

2016 July-August **Visiting Scholar - Sponsored by Dr. Thomas S. Woodson**
Department of Science and Society, Stony Brook University, NY, USA

2013-2014 **Visiting Scholar - Sponsored by Dr. Susan Cozzens**
Technology Policy Assessment Center, School of Public Policy, Georgia Institute of Technology, Atlanta, USA

2007-2008 **Assistant Researcher**
Science and Technology Policy Research and Information Center (STPI), National Applied Laboratories, Taipei, Taiwan

2006-2007 **Industrial Analyst**
Development Center for Biotechnology, Taipei, Taiwan

RESEARCH GRANT

2017-2019 **A Study on Innovation Networks in Emerging Technological Sectors: The case of Biotechnology Industry**
Funded by Ministry of Science and Technology, Taiwan

2015 -2016 **A Study on the Emergences of Emerging Technology Industries**, Funded by Institute of Technology Management, National Chiao Tung University, Taiwan

2015-2017 **Technology Roadmap : The Case of High-Tech Industry in Taiwan,** Funded by College of Management, National Chiao Tung University, Taiwan

2015 **Modelling R&D Collaborations of the Biotechnology Sector: The case of the Emerging Market in Taiwan,** Junior Faculty Research Enhancement Project, National Chiao Tung University, Funded by Ministry of Education (Grant # 104W986)

2014 **Global Networking Talent 3.0 Plan, Aiming for the Top University Program**, National Chiao Tung University, Funded by Ministry of Education (Grant # 103W938)

SCHOLARLY WORK

Journal Articles

- Chen, Shih-Hsin, The Confluence of Academia and Industry: A Case Study of the Taiwanese Biopharmaceuticals Innovation System, *Review of Policy Research, Volume 31, Issue 5, pages 408–429, September 2014. (SSCI)*
- Chen, Shih-Hsin, Egbetokun, Abiodun A. and Chen, Duen-Kai, Brokering Knowledge in Networks: Institutional Intermediaries in the Taiwanese Biopharmaceuticals Innovation System, *International Journal of Technology Management, Volume 69, Issue 3/4, pages 189–209, December 2015.* (SCI & SSCI)
- Chen, Shih-Hsin and Lin, Wei-Ting (2017) , The Dynamic Role of Universities in Developing an Emerging Sector: A Case Study of the Biotechnology Sector, *Technological Forecasting & Social Change, Vol.123, pp.283-297 (SSCI, IF=2.678).*
- Chen, Shih-Hsin* and (Lin, Wei-Ting) (forthcoming). Analysing determinants for promoting emerging technology through intermediaries by using a DANP-based MCDA framework. *Technological Forecasting and Social Change*, in press (SSCI, IF=2.678).
- Boon-Kwee Ng, Shih-Hsin Chen, VGR Chandran Govindaraju, and Chan-Yuan Wong (2019) ,University Incubation System for Research Commercialisation: The Case of Taiwan and Malaysia, *Science, Technology & Society*, Issue 2, Forthcoming (SSCI)
- (Omobhude, Christian) and Chen, Shih-Hsin (Forthcoming), Mix-Methods Approaches to Studying the Innovation Networks in Developing Countries, *African Journal of Science, Technology, Innovation and Development*. (Index in Elsevier's Scopus; Thomson Reuters Emerging Sources Citation Index)
- 林韋廷、陳詩欣（2017 年 6 月），台灣生醫產業研發合作之決策因子與決策規則分析，科技管理學刊，22 卷 2 期。(TSSCI)
- 林韋廷、陳詩欣（2018 年 2 月）研究型大學與研究機構之技術移轉影響準則分析，智慧財產評論，第 15 卷第 1 期，第 1-44 頁。

- **Book Chapters**

- Chen,Shih-Hsin and Woodson, S. Thomas (2018), *Building Bioeconomy in South Africa: Lessons from Biotechnology Innovation Networks in Taiwan*, Chapter 5, Beyond the imagination: genetics, Nano- and bio-technologies and their applications, pp129-151, Mapungubwe Institute for Strategic Reflection (MISTRA), South Africa (ISBN 978-0-6399238-0-2) **(Peer Reviewed)**.
- Chen, Shih-Hsin, Forbes, Ian and Martin, Paul (2012), Chapter 6, 'Knowledge Transfer and the Biopharmaceutical Innovation System in Taiwan'; in Siyanbola, et al. (Ed), *Innovation Systems and Capabilities in Developing Regions: Concepts, Issues and Cases*, pp97-117, Gower (ISBN: 978-1409423072) (**peer reviewed**)
- Chen, Shih-Hsin , "Regenerative Medicine Industry" in Liou, Mei-chih, Hsu, Yu-Chan, et.al (Ed); Biotechnology Industrial Year Book 2007, pp. 143-154, pp. 271-281, and pp. 351-356, Development Center for Biotechnology (in Chinese). (ISBN: 9789578514751)

Books

- Wu, Wen-ling; Chen, Shih-Hsin, et al., *Year Book of Pharmaceutical Industry 2007*, Development Center for Biotechnology, 2007 (in Chinese) (ISBN: 978-957-8514-76-8)
- Chen, Shih-Hsin, *The Future Trends and Opportunities of Major International and Domestic Pharmaceutical Company R&D and Strategic Alliances*, Development Center for Biotechnology, 2006 (in Chinese) (ISBN: 978-957-8514-71-3)
- Niu, Huei-Chih; Guo, Hua-Ren; Teng, Pei-Lun; Pen, Ying-Tai; Chen, Shih-Hsin; *Genetic Modified Organisms – Development, Dispute, Management and Regulation*, Bureau of Animal and Plant Health Inspection and Quarantine Council of Agriculture, Executive Yuan, October 2005 (in Chinese) (ISBN: 9789860020199)

Reports

- Chen, Shih-Hsin, *Study on Transforming Insect-Resistance Gene of Sweet Potato Sporamin into Brassica by Means of Pollen Tube Injection*, NSC Funded Research Project for College Students, 2000 (in Chinese)

Conferences

Conference Papers

- Chen, Shih-Hsin; (Lin, Wei-Ting); Chen, Duen-kai (2017, May). Geographical Proximity and Inter-firm R&D Networks in the Taiwanese Biotechnology Sector. 2017 Industry Studies Conference, Washington DC, USA.
- Cantner, Uwe, Chen , ShihHsin, and Egbetokun Abiodun , An Absorptive Capacity Perspective of Partner Selection in Innovation Networks: Theory and Propositions, 12th Globelics Conference, October 29-31, 2014, Addis Ababa, Ethiopia
- Chen, Shih-Hsin, Egbetokun, Abiodun and Chen, Duen-Kai, *Brokerage Role of Intermediaries in Innovation Networks: the Biopharmaceutical Innovation System in Taiwan*, 3rd Global Tech Mining Conference, September 25, 2013, Atlanta, Georgia, USA
- Chen, Shih-Hsin, *The Confluence of Academia and Industry: A Case Study of the Taiwanese Biopharmaceuticals Innovation System*, Atlanta Conference on Science and Innovation Policy, September 26-28, 2013, Atlanta, Georgia, USA
- Chen, Shih-Hsin, Networking and Knowledge Transfer in the Taiwanese Biopharmaceutical Innovation System, Globelics Conference 2012, November 9-11, 2012, Hangzhou, China

- Chen, Shih-Hsin, *Industrializing Academia: Developing Knowledge Transfer and the Biopharmaceutical Innovation System in Taiwan*, Globelics Academy, May 16-27, 2011, Tampere, Finland
- Chen, Duen-Kai, Chen, Shih-Hsin and Teng, Pei-Lun, *Issues Concerning Patients' Privacy Rights under E-health Era in Taiwan's Legal Regime*, International Congress on Medical Law, August 15, 2005, Seoul, Korea
- Chen, Duen-Kai and Chen, Shih-Hsin, *E-Health in Taiwan: Law and Regulatory Perspective*, The 3rd International Conference on Politics and Information Systems: Technologies and Applications (PISTA'05), July 2005, Orlando, Florida, USA
- Chen, Shih-Hsin, *The Scope and Implementation Limitations of Teaching Materials for Life Science Course in Senior High School*, National Taiwan University, April 29, 2005,Taipei, Taiwan (in Chinese)
- Chen, Shih-Hsin and Chen, Duen-Kai, *Law and Regulatory Perspective of Gene Flow*, In re StarLink and Monsanto Canada, Inc. v. Percy Schmeiser, et al., 8th National Technology Law Conference, 2004, Shin-Chu, Taiwan (in Chinese)

Conference Presentations

- Chen, Shih-Hsin; (Lin, Wei-Ting); Chen, Duen-kai (2017,October). Analyzing the Cluster Effects on Biotechnology Innovation Networks in Taiwan, Atlanta Conference on Science and Innovation Policy, October 9-11, 2017 Atlanta, Georgia, USA
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- Chen, Shih-Hsin, Lin Wei-Ting, and Chen, Duen-Kai, *The Emergence of Innovation Networks in an Emerging Biotechnology Sector: The Case of Taiwan*, Business Networks session of Sunbelt XXXVI Conference, 5-10 April 2016, Newport Beach, CA, USA
- Chen,Shih-Hsin and Woodson, S. Thomas, *Building Bioeconomy in South Africa: Lessons from Biotechnology Innovation Networks in Taiwan, BEYOND THE IMAGINATION Colloquium: Genetics, nano, biotechnologies, and their applications, October 13th, 2015, Development Bank of Southern Africa (DBSA), Midrand, South Africa (Skype)*
- Chen, Shih-Hsin, (Lin, Wei-Ting*), (Chiang, Chia-Hsin), (Chiu, Hung-Yi), Networking and R&D Collaborations in the Taiwanese Biotechnology Sector, Business Networks session of Sunbelt XXXV Conference, 23-28 June 2015, Brighton, UK
- Chen, Shih-Hsin, *The Evolving Role of Laboratories in the Taiwanese Biopharmaceutical Innovation System*, 4S/EASST Joint Meeting 2012, October 17-20, 2012, Copenhagen Business School, Frederiksberg, Denmark
- Chen, Shih-Hsin, *Institutional evolution in the Taiwanese Biopharmaceutical Innovation System: the Evolving Roles of Research Institutes*, 18th SPRU Dphil Day, May 28-29, 2012, University of Sussex, Brighton, UK

- Chen, Shih-Hsin, *Learning from the US: the Relevance of Knowledge Transformed from Abroad in the Taiwanese Biopharmaceutical Sector*, ST Global 2012, March 30-31, 2012, DC, USA
- Chen, Shih-Hsin, *Building a Bridge between Academia and Industry within the Biopharmaceutical Innovation Systems in Taiwan: An Empirical Study of a Small Emerging Economy*, ST Global 2011, April 15-16, 2011, Washington DC, USA
- Chen, Shih-Hsin, *Building a Biotechnology Industry in an Emerging Economy: The case of Taiwan*, Annual Conference of CSMOT 2010, December 10, 2010, Hsinchu, Taiwan (in Chinese)

Conference Posters

- Chen,Shih-Hsin, Chen, Duen-Kai, and (Lin, Wei-Ting) *The Key Factors of Establishing R&D Collaboration in an Emerging High-Tech Sector,* Atlanta Conference on Science and Innovation Policy, September 17-19 , 2015, Atlanta, Georgia, USA
- Chen,Shih-Hsin and Woodson, S. Thomas, *Building Bioeconomy in South Africa: Lessons from Biotechnology Innovation Networks in Taiwan*, Atlanta Conference on Science and Innovation Policy, September 17-19 , 2015, Atlanta, Georgia, USA
- Chen, Duen-Kai , Chen, Shih-Hsin, (Lin, Wei-Ting) and Chiu, Yao-Ching, Hybrid of Agent-Based Modelling Simulation with Social Network Analysis for Innovation Study, 5th Global Tech Mining Conference, September 16, 2015, Atlanta, Georgia, USA
- Chen, Shih-Hsin, (Lin, Wei-Ting), (Chiang, Chia-Hsin), (Chiu, Hung-Yi), An Inter-Organizational Network Perspective on the Emergence of Biotechnology Sector, 5th Global Tech Mining Conference, September 16, 2015, Atlanta, Georgia, USA
- Chen, Duen-Kai, and Chen, Shih-Hsin, Brokering Knowledge in Innovation Networks: an Agent-Based Modelling Simulation Approach, AAAS Conference February 12-15, 2015, San Jose, California, USA
- Chen, Shih-Hsin, and Woodson, S. Thomas, Building Bioeconomy in South Africa: Lessons from biopharmaceutical Innovation Networks in China and Taiwan, Gordon Research Conference, August 9-15, 2014, New Hampshire, USA (in English)
- Chen, Shih-Hsin, *The Evolution of Global Knowledge Production Networks in the Taiwanese Biopharmaceuticals Innovation System*, Gordon Research Seminar, August 4-5, 2012, New Hampshire, USA
- Chen, Shih-Hsin, *The Evolving Role of Institutions in Knowledge Transfer Networks: An empirical study of the Taiwanese Biopharmaceuticals Innovation System*, Gordon Research Conference, August 5–10, 2012, New Hampshire, USA
- Chen,Shih-Hsin and Chen, Duen-Kai, *Developing Knowledge Transfer and the Biopharmaceutical Research Collaboration in the Innovation System of Taiwan*, Atlanta Conference on Science and Innovation Policy, Atlanta, Georgia, USA
- Chen, Shih-Hsin, *Ethical, Legal and Social Issues (ELSI) in the Studies of Biopharmaceuticals Innovation System*, 2011 ELSI Congress, April 12-14, 2011, Chapel Hill, USA
- Chen, Shih-Hsin and Chen, Duen-Kai, Privacy, Public health, and the Electronic Patient Records: A Comparative Analysis of the Laws of Taiwan and the US; the Public's Health and the Law in the 21st Century, Fifth Annual Partnership Conference, June 12-14, 2006, Atlanta, USA

HONORS AND AWARDS

2014-2017	**Strategic Overseas Returning Faculty Recruitment Scheme,** National Chiao Tung University, Funded by Ministry of Science and Technology
2012-2013	**Dissertation Fellowships for ROC Students Abroad** Chiang Ching-kuo Foundation for International Scholarly Exchange ($15,000)
2009-2011	**Doctoral Fellowship for Studying Abroad** Taiwan Ministry of Education ($50,000)
1999-2000	**College Student Participation in Research Projects Award** National Science Council, Taiwan ($1,000)

PROFESSIONAL CERTIFICATIONS

2014-2017	**Collaborative Institutional Training Initiative (CITI)** Human Research Curriculum – Group 2 SBE Research
2011	**Qualification to Teach Chinese as a Second Language** Taiwan Ministry of Education (Ref E1000065)
2009	**National Certificated College Lecturer** Taiwan Ministry of Education (Ref 095763)
2008	**APIAA Certificated Industry Analyst (ACIA)** Asia Pacific Industrial Analysis Association

PROFESSIONAL TRAINING

June 19-30 2016	**Symposium for Entrepreneurship Educators (SEE)** Babson College, Wellesley, Masschusses , United States
April 5-10, 2016	**International Network for Social Network Analysis (INSNA) Training Workshop 2016 - UNINET & GEPHI** Newport Beach, California, United States
January 3-10, 2016	**CNS-ASU Winter School 2016- Winter School on the Anticipatory Governance and Responsible Innovation of Emerging Technologies** Saguaro Lake Ranch in Mesa, AZ, United States
September 15	**Tech-Mining with Vantage Point Training Workshops** Georgia Institute of Technology, Atlanta, GA, USA
June 6-13, 2014	**Faculty Development Program- Course Design Studio** CETL, Georgia Institute of Technology, Atlanta Georgia, United States
November 6th 2013	**Manchester Forum on Data Science, Tech Mining and Innovation** Manchester Business School, Manchester, United Kingdom
November 21st-23rd 2012	**Networks & Innovation Training Program** UK-IRC, Imperial College, London, United Kingdom
June 27th, 2012	**Organisational Network Analysis with UCINET/Pajek Workshop** 8th UKSNA Conference & Workshops, Bristol, United Kingdom

June 2011	**The Intensive Learning and Teaching Programme (ILTP)** Professional Development, University of Nottingham, United Kingdom
May 2011	**7th Globelics Academy 2011** Ph.D. School on Innovation and Economic Development, Tempere, Finland

PROFESSIONAL SERVICE

December 2016-now	**Journal Paper Reviewer of Technological Forecasting and Social Change** Review submitted manuscript
July 2016-now	**Journal Paper Reviewer of African Journal of Science, Technology, Innovation and Development (AJSTID), published by Routledge, Taylor & Francis Group** Review submitted manuscript
May 2015-now	**Journal Paper Reviewer of Science and Public Policy** Review submitted manuscript
February 2014-March 2016	**Research Group Leader** Project Title: Beyond Imagination- Genetics, Nano- And Bio-Technologies And Their Applications Recruit contributors for the project, assist coordinator to outline the research
September 2013	**Journal Paper Reviewer of Scientometrics** Review submitted manuscript (ISSN: 0138-9130)
December 2011-January 2012	**Institute of Science and Society, University of Nottingham** Organising a special guest seminar
January-October 2007	**Chief Editor of the Year Book of Pharmaceutical Industry** Outline the content of book, recruit chapter contributors, proof-reading the entire book.
September 2001-June 2002	**School Affairs Development Committee** Graduate Student Representative, National Tsing Hua University, Taiwan

PROFESSIONAL SOCIETIES

2011-2013	**Society for the Social Studies of Science (4S)**
2014-Present	**International Studies Association (ISA)**
2011-Present	**Global Network for Economics of Learning, Innovation, and Competence Building Systems (Globelics)**
2014-Present	**American Association for the Advancement of Science (AAAS)**
2014-Present	**Academy of Management (AOM)**

References Provided Upon Request