

SHAN LIU
Curriculum Vitae

Industrial and Systems Engineering
141E AERB, University of Washington
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EDUCATIONAL HISTORY

Stanford University, Stanford, CA

Ph.D., Management Science & Engineering
June 2013

“Optimizing Hepatitis C Treatment Decisions in an Era of Rapid Technological Advances: Models and Insights.” Doctoral dissertation. Advisors: Jeremy Goldhaber-Fiebert and Margaret Brandeau

MIT, Boston, MA

S.M., Technology and Policy
May 2008

“Process Based Cost Modeling of Emerging Optoelectronic Interconnects: Implications for Material Platform Choice.” Master’s thesis. Advisor: Dr. Randolph E. Kirchain, Jr.

University of Texas-Austin, Austin, TX

B.S., Electrical Engineering
May 2006

EMPLOYMENT HISTORY

University of Washington
Seattle, WA, USA

Associate Professor, Industrial & Systems Engineering, 2019-present
Assistant Professor, Industrial & Systems Engineering, 2013-2019

Stanford University, Center for Primary Care and Outcomes Research
Stanford, CA, USA
Graduate Research Fellow, 2009-2013

Veteran Affairs Palo Alto Health Care System
Palo Alto, CA, USA
Medical Decision Model Analyst II, summer 2011 and 2013

United Nations Industrial Development Organization
Beijing, China
Research Fellow, summer 2008

MIT Microphotonics Center
Cambridge, MA, USA
Graduate Research Fellow, 2006-2008

HP Labs

Beijing, China
Intern, summer 2007

Cable Television Laboratories, Inc.
Boulder, CO, USA
Intern, summer 2004 and 2005

AWARDS AND HONORS

Lee B. Lusted Prize Finalist, 2011 & 2013, Society for Medical Decision Making
Stanford Graduate Fellowship, 2008-2011, Stanford University
MIT Far East Graduate Fellowship, 2006, MIT
University of Texas Distinguished College Scholar, 2006, UT-Austin
T.C. & Grace T. Ho Endowed Scholarship, 2005–2006, UT-Austin

AFFILIATIONS

Adjunct Associate Professor, Radiology, University of Washington, 2019-present
Adjunct Assistant Professor, Radiology, University of Washington, 2014-2019

PUBLICATIONS

Refereed Archival Journal Publications

- J1. Pietzsch JB, Richter AK, Randerath W, Steffen A, **Liu S**, Geisler BP, Wasem J, Biermann-Stallwitz J. 2019. Clinical and economic benefits of upper airway stimulation for obstructive sleep apnea in a European setting. *Respiration* 98:38-47.
- J2. Ho T¹, **Liu S**, Zabinsky ZB. 2019. A branch-and-bound approach for dynamic resource allocation in population disease management. *OR Letters* 47(6):579-586.
- J3. Wagner AD, Gimbel S, Asbjornsdottir KH, Cherutich P, Coutinho J, Crocker J, Cruz E, Cuembelo F, Cumbe V, Eastment M, Einberg J, Floriano F, Gaitho D, Guthrie BL, John-Stewart G, Kral AH, Lambdin BH, **Liu S**, Maina M, Manaca N, Matsuzaki M, Mattox L, Mburu N, McClelland RS, Micek MA, Mocumbi AO, Muanido A, Nduati R, Njuguna IN, Oluoch G, Oyiengo L, Ronen K, Soi C, Wagenaar BH, Wanje G, Wenger LD, Sherr K. 2019. Cascade analysis: an adaptable implementation strategy across HIV and non-HIV platforms. *Journal of Acquired Immune Deficiency Syndromes (JAIDS)* 82: S322-S331.
- J4. Gong J¹, Simon GE, **Liu S**. 2019. Machine learning discovery of longitudinal patterns of depression and suicidal ideation. *PLOS ONE* 14(9): e0222665.
- J5. Wagner AD, Crocker J, **Liu S**, Cherutich P, Gimbel S, Fernandes Q, Mugambi M, Ásbjörnsdóttir K, Masyuko S, Wagenaar BH, Nduati R, Sherr K. 2019. Making smarter decisions faster: systems engineering to improve the global public health response to HIV. *Current HIV/AIDS Reports* 16:279.
- J6. Faucett SC, Geisler BP, Chahla J, Krych AJ, Kurzweil PR, Garner AM, **Liu S**, LaPrade RF, Pietzsch JB. 2019. Meniscus Root Repair vs Meniscectomy or Nonoperative Management to Prevent Knee Osteoarthritis after Medial Meniscus Root Tears: Clinical and Economic Effectiveness. *The American Journal of Sports Medicine* 47(3): 762–769.
- J7. **Liu S**, Wang S, Chaovalitwongse WA, Bowen SR. 2019. Cost-effectiveness of patient-specific motion management strategy in lung cancer radiation therapy planning. *Engineering Economist* 64(4): 368-386.
- J8. Lin Y¹, Huang S, Simon GE, **Liu S**. 2019. Cost-effectiveness analysis of prognostic-based depression monitoring. *IIE Transactions on Healthcare Systems Engineering* 9(1):41-54.

- J9. Ho T¹, **Liu S**, Zabinsky ZB. 2019 (epub 2018). A multi-fidelity rollout algorithm for dynamic resource allocation in population disease management. *Healthcare Management Science* 22(4):727-755.
- J10. Cipriano LE, Goldhaber-Fiebert JD, **Liu S**, Weber TA (*alphabetical author order*). 2018. Optimal information collection policies in a Markov Decision Process framework. *MDM* 38(7):797-809.
- J11. Cipriano LE, **Liu S**, Shahzada KS, Holodniy M, Goldhaber-Fiebert JD. 2018. Economically efficient hepatitis C virus treatment prioritization improves health outcomes. *MDM* 38(7):849-865
- J12. Lin Y¹, **Liu S**, Huang S. 2018. Selective sensing of a heterogeneous population of units with dynamic health conditions. *IIE Transactions* 50 (12):1076-1088.
- J13. Lin Y¹, Huang S, Simon GE, and **Liu S**. 2018. Data-based decision rules to personalize depression follow-up. *Scientific Reports* 8(1): 5064.
- J14. Lin Y¹, Liu K, Byon E, Qian X, **Liu S**, Huang S. 2018 (epub 2017). A collaborative learning framework for estimating many individualized regression models in a heterogeneous population. *IEEE Transactions on Reliability* 67(1):328-341.
- J15. Feller-Kopman DJ, **Liu S**, Geisler B, Decamp M, Pietzsch JB. 2017. Cost-effectiveness of a bronchial genomic classifier for the diagnostic evaluation of lung cancer. *Journal of Thoracic Oncology* 12(8):1223-1232.
- J16. Li Y¹, Huang H¹, Zabinsky ZB, **Liu S**. 2017. Optimizing implementation of hepatitis C birth-cohort screening and treatment strategies: model-based projections. *MDM Policy & Practice* 2(1).
- J17. Lin Y¹, Huang S, Simon GE, **Liu S**. 2016. Analysis of depression trajectory patterns using collaborative learning. *Mathematical Biosciences* 282(2016):191-203.
- J18. **Liu S**, Barnett PG, Holodniy M, Lo JJ, Joyce VR, Gidwani R, Asch SM, Owens DK, Goldhaber-Fiebert JD. 2016. Cost-effectiveness of treatments for genotype 1 hepatitis C virus infection in non-VA and VA populations. *MDM Policy & Practice* 1(1).
- J19. Feeley BT, **Liu S**, Garner AM, Zhang AL, Pietzsch JB. 2016. The cost-effectiveness of meniscal repair versus partial meniscectomy: a model-based projection. *The Knee* 23(4):674-80.
- J20. Noblett KL, Dmochowski RR, Vasavada SP, Garner AM, **Liu S**, Pietzsch JB. 2017 (epub 2016). Cost profiles and budget impact of rechargeable vs. non-rechargeable sacral neuromodulation devices in the treatment of overactive bladder syndrome. *Neurourology and Urodynamics* 36(3):727-733.
- J21. **Liu S**, Brandeau M, Goldhaber-Fiebert JD. 2017 (epub 2015). Optimizing patient treatment decisions in an era of rapid technological advances. *Healthcare Management Science* 20(1):16-32.
- J22. Pietzsch JB, **Liu S**, Kezirian E, Strollo P. 2015. Long-term cost-effectiveness of upper airway stimulation for the treatment of obstructive sleep apnea: a model-based projection based on the STAR trial. *SLEEP* 38(5):735–744.
- J23. **Liu S**, Watcha D, Holodniy H, Goldhaber-Fiebert JD. 2014. Sofosbuvir-based treatment regimens for chronic, genotype 1 hepatitis C infections in US incarcerated populations: a cost-effectiveness analysis. *Annals of Internal Medicine* 161:546-553.
- J24. **Liu S**, Cipriano LE, Holodniy M, and Goldhaber-Fiebert JD. 2013. Cost-effectiveness analysis of risk-factor guided and birth-cohort screening for chronic hepatitis C infection in the United States. *PLOS ONE* 8(3): e58975. doi:10.1371/journal.pone.0058975
- J25. **Liu S**, Cipriano LE, Holodniy M, Owens DK, and Goldhaber-Fiebert JD. 2012. New protease inhibitors for the treatment of chronic hepatitis C: A cost-effectiveness analysis. *Annals of Internal Medicine* 156: 279-290.

¹ Published with graduate students

- J26. **Liu S**, Schwarzinger M, Carrat F, and Goldhaber-Fiebert JD. 2011. Cost effectiveness of fibrosis assessment prior to treatment for chronic hepatitis C patients. *PLOS ONE* 6(12): e26783. doi:10.1371/journal.pone.0026783
- J27. Fuchs E, Kirchain R, and **Liu S** (*alphabetical author order*). 2011. The future of silicon photonics – not so fast? Insights from 100G ethernet LAN transceivers. *Journal of Lightwave Technology* 29(15): 2319-2326.

Papers Submitted for Archival Journals

- J28. Ho T¹, Zabinsky ZB, Fishman PA, **Liu S**. Prevention of seasonal influenza outbreak via healthcare insurance.
- J29. Gong J¹ and **Liu S**. Partially observable collaborative model for optimizing personalized treatment selection.
- J30. Palmer AZ, Zabinsky ZB, **Liu S**. Optimal control of COVID-19 infection rate considering social costs. Published on arxiv, July 27 2020. <https://arxiv.org/pdf/2007.13811.pdf>

Papers in preparation

- J31. Lee S¹, Zabinsky ZB, Kofsky SM, **Liu S**. COVID-19 pandemic response simulation: impact of non-pharmaceutical interventions on ending lockdowns. Published on Medrxiv, May 4 2020. <https://www.medrxiv.org/content/10.1101/2020.04.28.20080838v1>
- J32. Sun X¹, **Liu S**. Cost-effectiveness analysis of adaptive monitoring technology: a case study on chronic depression treatment.
- J33. Siriruchatanon M¹, **Liu S**, Duarte H. Cost-effectiveness analysis of dolutegravir treatment for HIV-infected children in Kenya.
- J34. Siriruchatanon M¹, **Liu S**. Personalized adaptive treatment selection for chronic disease.
- J35. Dolan S¹, Burstein R, Shearer J, Lymo DC, Lyons H, Carnahan E, Beylerian E, Thompson J, Puttkammer N, Lober B, **Liu S**, Gilbert SS, Werner L, Ryman TK. Changes in on-time vaccination following the introduction of an electronic immunization registry, Tanzania 2016-2018: interrupted time-series analysis.
- J36. Gong J¹ and **Liu S**. Robust partially observable Markov decision processes with uncertain parameters.

Conference Proceedings and Other Non-Journal Articles

Fully refereed publications

- C1. Huang H¹, Zabinsky ZB, Li Y¹, **Liu S**. Analyzing hepatitis C screening and treatment strategies using probabilistic branch and bound. *Proceedings of the 2016 Winter Simulation Conference*. TMK Roeder, PI Frazier, R Szechtman, and E Zhou, eds Washington D.C., 2016.
- C2. **Liu S**, Cipriano LE, and Goldhaber-Fiebert JD. Combining statistical analysis and Markov models with public health data to infer age-specific background mortality rates for hepatitis C infection in the U.S. (Extended Abstract). *Lecture Note in Computer Science Series*, Springer. International Conference on Smart Health, LNCS 8549 proceedings. 2014.
- C3. Goldhaber-Fiebert JD, Barnett PG, Dally S, Asch SM, **Liu S**, Cipriano L, Owens DK, Miakel-Lye IM, Beroes JM, Shekelle PG. Assessment of alternative treatment strategies for chronic genotype 1 hepatitis C. VA Evidence-Based Synthesis Program Project 05-226, 2013. <http://www.hsrd.research.va.gov/publications/esp/hcv.cfm#.UXOBOqK86So>

Refereed by abstract only

- C4. Siriruchatanon M¹, **Liu S**, Duarte H. “Cost-effectiveness analysis of pediatric ART policy options in the presence of pretreatment NNRTI drug resistance in Kenya.” 42nd Society for Medical Decision Making (SMDM) Annual Meeting, virtual, 2020. Siriruchatanon M is a **Lee B. Lusted Prize Finalist**.
- C5. Lee S¹, Zabinsky ZB, Kofsky S, **Liu S**. “Agent-based simulation study of reopening scenarios

- for COVID-19 in a large urban area.” 42nd SMDM Annual Meeting, virtual, 2020. Lee S is a **Lee B. Lusted Prize Finalist**.
- C6. Sun X¹, **Liu S**. “A decision-analytic framework to evaluate the cost-effectiveness of adaptive monitoring technology: the case of chronic depression.” 42nd SMDM Annual Meeting, virtual, 2020.
- C7. Siriruchatanon M¹, **Liu S**, Duarte H. “Cost-effectiveness analysis of pre-ART drug resistance testing for HIV-infected children in Kenya.” 41st SMDM Annual Meeting, Portland, OR, 2019.
- C8. Siriruchatanon M¹, **Liu S**. “Personalized adaptive treatment selection for chronic depression.” 41st SMDM Annual Meeting, Portland, OR, 2019.
- C9. Lin Y¹, Huang S, **Liu S**. “Designing prognostic-based depression monitoring strategies in cost-effective ways.” 40th SMDM Annual Meeting, Montreal, Quebec, Canada, 2018.
- C10. Ho T¹, **Liu S**, Zabinsky ZB. “Dynamic resource allocation algorithm for population disease management.” 40th SMDM Annual Meeting, Montreal, Quebec, Canada, 2018.
- C11. Gong J¹, Simon GE, **Liu S**. “Machine learning discovery of longitudinal patterns of depression and suicidal ideation.” 40th SMDM Annual Meeting, Montreal, Quebec, Canada, 2018. Gong J is a **Lee B. Lusted Prize Finalist**.
- C12. Gong J¹ and **Liu S**. “Partially observable collaborative model for optimizing personalized treatment selection.” 40th SMDM Annual Meeting, Montreal, Quebec, Canada, 2018.
- C13. Lin Y¹, **Liu S**, Huang S. “Selective sensing of a heterogeneous population of units with dynamic health.” *IISE Annual Conference & Expo 2017*, Pittsburg, PA, 2017. **Quality Control and Reliability Best Student Paper Competition finalist**.
- C14. Cipriano LE, **Liu S**, Shahzada KS, Goldhaber-Fiebert JD. “Patient prioritization in disease-specific-treatment budgets: the case of chronic hepatitis c treatment.” 38th SMDM Annual Meeting, Vancouver, BC, Canada, 2016.
- C15. Lin Y¹, Huang S, **Liu S**. “Adaptive monitoring of depression patient population: a selective sensing approach.” 38th SMDM Annual Meeting, Vancouver, BC, Canada, 2016. Lin Y is the **winner of the Lee B. Lusted student prize** for outstanding presentations of research in quantitative methods and theoretical developments.
- C16. Lin Y¹, Huang S, **Liu S**. “A longitudinal pattern based prognostic model for depression monitoring via rule-based method.” 38th SMDM Annual Meeting, Vancouver, BC, Canada, 2016. Lin Y is a **Lee B. Lusted Prize Finalist**.
- C17. Huang J¹, **Liu S**. “Analyzing population progression dynamics of depression from electronic health record using a family of Markov models.” 38th SMDM Annual Meeting, Vancouver, BC, Canada, 2016.
- C18. Sheng W¹, **Liu S**. “Depression management using electronic health record: personalized progression prediction and monitoring.” 38th SMDM Annual Meeting, Vancouver, BC, Canada, 2016.
- C19. Feller-Kopman DJ, **Liu S**, Garner AM, Decamp M, Pietzsch JB. “Cost-effectiveness of the Percepta bronchial genomic classifier for the diagnostic evaluation of lung cancer: an analytical framework based on the AEGIS studies.” American Thoracic Society International Conference, San Francisco, California, 2016.
- C20. Gregersen K¹, Johnson P, Spector J, **Liu S**, Veenstra D. “Whole body vibration exposures: using low back and neck claims to assess the cost and health effects of different bus driver seats.” Proceedings of the Eighth International Scientific Conference on Prevention of Work-Related Musculoskeletal Disorders, PREMUS: Toronto, CA, 2016.
- C21. Lin Y¹, Huang S, **Liu S**. “Analysis of depression trajectory patterns using collaborative learning.” 37th SMDM Annual Meeting, St. Louis, Missouri, 2015.
- C22. Noblett KL, Dmochowski RR, Vasavada SP, Garner AM, **Liu S**, Pietzsch JB. “Cost profile of rechargeable vs. non-rechargeable neuromodulation devices in the treatment of overactive

- bladder syndrome.” North American Neuromodulation Society (NANS) annual meeting, Las Vegas, Nevada, 2015.
- C23. Feeley BT, **Liu S**, Garner AM, Zhang AL, Pietzsch JB. “The cost-effectiveness of meniscal repair versus partial meniscectomy: a model-based projection of clinical outcomes and costs in the United States healthcare system.” International Society for Pharmacoeconomics and Outcomes Research (ISPOR) 20th Annual International Meeting, Philadelphia, Pennsylvania, 2015.
- C24. **Liu S**, Watcha D, Holodniy H, Goldhaber-Fiebert JD. “Cost-effectiveness of hepatitis C treatment delivery in U.S. incarcerated populations.”
a. 36th SMDM Annual Meeting, Miami, Florida, 2014.
b. SMDM 15th Biennial European Meeting, Antwerp, Belgium, 2014.
- C25. Pietzsch JB, **Liu S**, Kezirian EJ, Strollo PJ. “Long-term cost-effectiveness of upper airway stimulation for the treatment of obstructive sleep apnea - a model-based projection based on the STAR trial.” 28th Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, Minnesota, 2014.
- C26. Cipriano LC, **Liu S**, Goldhaber-Fiebert J. “Optimal information collection policies in a Markov decision process framework.” 35th SMDM Annual Meeting, Baltimore, Maryland, 2013.
- C27. **Liu S**, Brandeau M, Goldhaber-Fiebert J. “Optimizing patient treatment decisions in an era of rapid technological advances.” 35th SMDM Annual Meeting, Baltimore, Maryland, 2013. **Liu S** is a *Lee B. Lusted Prize Finalist*.
- C28. **Liu S**, Cipriano LE, Goldhaber-Fiebert JD. “Combining regression analyses and Markov models to infer age-specific mortality rates by hepatitis C infection and risk factor status.” 34th SMDM Annual Meeting, Phoenix, Arizona, 2012.
- C29. **Liu S**, Cipriano LE, Holodniy M, Goldhaber-Fiebert JD. “Cost-effectiveness of risk-factor guided and universal screening for chronic hepatitis C.” 33rd SMDM Annual Meeting, Chicago, Illinois, 2011. **Liu S** is a *Lee B. Lusted Prize Finalist*.
- C30. **Liu S**, Cipriano LE, Goldhaber-Fiebert JD. “With more effective therapies, should we screen for chronic hepatitis C in the US?” 33rd SMDM Annual Meeting, Chicago, Illinois, 2011.
- C31. **Liu S**, Schwarzing M, Carrat F, Goldhaber-Fiebert JD. “Cost-effective alternatives to liver biopsy in the management of chronic hepatitis C.” 32nd SMDM Annual Meeting, Toronto, Canada, 2010.

Refereed Book Chapter

Liu S, “Chapter 6. Modeling chronic hepatitis C during rapid therapeutic advance: cost-effective screening, monitoring and treatment strategies.” *Decision Analytics and Optimization in Disease Prevention and Treatment*. Editors: Shengfan Zhang and Nan Kong. Wiley Series in Operations Research and Management Science. ISBN: 978-1-118-96012-7, Mar 2018.

Liu S and Huang S, “How AI can help Depression Treatment: Designing Patient-Specific Adaptive Interventions.” *Modeling for Health: Making Changes*. Editors: Eva Enns, David Scheinker, and Sze-Chuan Suen. Cambridge University Press. Under revision.

Technical Reports

1. Oxygen as a utility: an innovative model for increasing access to oxygen in low-and middle-income countries. PATH, 2019. (Contributed technical content in the report)
2. Goldhaber-Fiebert JD, Cipriano LE, **Liu S**. How best to offer treatment to all eligible patients with chronic hepatitis C viral infections in the VA health system within the next 3 years. Veterans Affairs. 2015.

3. **Liu S.** Chronic hepatitis C care: review of treatment advances, quality of life, and cost. Report, health economics resource center, Veterans Affairs Palo Alto Health Care System, Menlo Park, CA. 2011.
4. Goldhaber-Fiebert JD, **Liu S**, Owens D, and Barnett P. Preliminary VHA analysis: budget impact and health impact of chronic genotype 1 HCV treatment over 5 years and 10 years. White paper, Veterans Health Administration. 2011.
5. **Liu S.** HCFCs phase-out impact on climate change, assessment of possible scenarios in China's room air conditioning sector. Report, United Nations Industrial Development Organization, Beijing, China. 2008.
6. **Liu S** and Fuchs E. Envisioning the future of optoelectronic interconnects: production economics of InP and Si platforms for 100G Ethernet LAN transceivers. White paper, MIT Microphotonics Consortium. 2007.

OTHER SCHOLARLY ACTIVITY

Invited lectures and seminars.

1. UW Department of Statistics seminar, *Optimizing Healthcare Interventions and Incentives: Models and Insights for Depression and Influenza*, Feb 14 2020.
2. UW Department of Psychiatry and Behavioral Sciences, Population Health Division seminar, *Prognostic-Based Depression Monitoring: Model and Insight*, Apr 3 2019.
3. University of British Columbia, Sauder School of Business, *Optimizing Dynamic Resource Allocation: Models and Insights for Chronic Disease Care*, Mar 21 2018.
4. UW School of Public Health, Program in Health Economics and Outcomes Methodology seminar, *Optimizing Dynamic Decision-Making: Models and Insights for Chronic Disease Care*, Feb 21 2018.
5. University of Southern California, Department of Industrial & Systems Engineering, Epstein Seminar Series, *Operations Research in Medical Decision Making: Models and Insights for Depression Care Management*, Sept 12 2017.
6. NSF-IMA Industrial Mathematics Workshop, University of Minnesota, July 24-26 2017.
7. UW Radiation Oncology department seminar, *Operations Research in Medical Decision Making: Insights for Chronic Disease Management*, Jan 29 2016.
8. UW Department of Global Health and USAID, guest lecture in Intensive Course on Implementation Science for Family planning and Reproductive Health, *Operations Research: Contributions from Industrial Engineering*, Aug 8 2014, Aug 6 2015, and Sept 14 2016.
9. HCV Project ECHO Western States meeting, *Healthcare Modeling and Decision Making: Models and Insights for Chronic Hepatitis C*, Nov 17 2014.
10. Harborview Injury Prevention & Research Center seminar, *Healthcare Modeling and Decision Making: Models and Insights for Chronic Hepatitis C*, Mar 25 2015.
11. UW Fundamentals of Implementation Science in Global Health (GH541), *Simulation and Optimization in Healthcare Modeling*, May 22 2015, May 20 2016, May 19 2017, Aug 30 2018, Apr 23 2020.

Presentations given at conferences (presenters in bold)

- P1. **Liu S**, "Optimizing societal reopening plans and vaccine distribution strategies under COVID-19 using simulation optimization tools." Keynote Symposium on COVID-19 Decision Modeling, 42nd SMDM Annual Meeting, virtual, 2020.
- P2. **Wagner AD**, Gimbel S, Asbjornsdottir KH, Cherutich P, Coutinho J, Crocker J, Cruz E, Cuembelo F, Cumbe V, Eastment M, Einberg J, Floriano F, Gaitho D, Guthrie BL, John-Stewart G, Kral AH, Lambdin BH, Liu S, Maina M, Manaca N, Matsuzaki M, Mattox L,

- Mburu N, McClelland RS, Micek MA, Mocumbi AO, Muanido A, Nduati R, Njuguna IN, Oluoch G, Oyiengo L, Ronen K, Soi C, Wagenaar BH, Wanje G, Wenger LD, Sherr K. "Cascade analysis: an adaptable implementation strategy across HIV and non-HIV platforms." 12th Conference on the Science of Dissemination & Implementation in Health, Arlington, Virginia. December 2019.
- P3. **Siriruchatanon M**, Liu S, Duarte H. "Cost-effectiveness analysis of pre-treatment drug resistance (PDR) testing for HIV+ children in Africa." INFORMS Annual Conference, Seattle, Washington. October 2019.
- P4. **Siriruchatanon M**, Liu S. "Personalized treatment for chronic depression with individual treatment effect estimation." INFORMS Annual Conference, Seattle, Washington. October 2019.
- P5. Gong J, **Liu S**. "Robust partially observable Markov Decision Process with uncertain parameters." INFORMS Annual Conference, Seattle, Washington. October 2019.
- P6. **Siriruchatanon M**, Liu S, Duarte H. "Cost-effectiveness analysis of pre-ART drug resistance testing for HIV-infected children in Kenya." 41st SMDM Annual Meeting, Portland, OR, 2019.
- P7. **Siriruchatanon M**, Liu S. "Personalized adaptive treatment selection for chronic depression." 41st SMDM Annual Meeting, Portland, OR, 2019.
- P8. Ho T, **Liu S**, Zabinsky ZB. "Branch-and-bound algorithm for dynamic resource allocation in population disease management." INFORMS Healthcare Conference, Boston, Massachusetts. July 2019.
- P9. Ho T, Zabinsky ZB, Fishman PA, **Liu S**. "Incentive mechanism for the prevention of seasonal influenza outbreak." INFORMS Healthcare Conference, Boston, Massachusetts. July 2019.
- P10. Siriruchatanon M, **Liu S**. "A conceptual decision support tool for personalized treatment selection in chronic depression." INFORMS Healthcare Conference, Boston, Massachusetts. July 2019.
- P11. Gong J, **Liu S**. "Optimizing personalized treatment selection for partially observable chronic conditions." INFORMS Healthcare Conference, Boston, Massachusetts. July 2019.
- P12. **Gong J**, Liu S. "Robust personalized treatment selection for partially observable chronic conditions." INFORMS Annual Conference, Phoenix, Arizona. November 2018.
- P13. **Gong J**, Liu S. "Partially observable collaborative model for optimizing personalized treatment selection." INFORMS Annual Conference, Phoenix, Arizona. November 2018.
- P14. **Siriruchatanon M**, Liu S. "Personalized treatment monitoring and switching policies for chronic depression." INFORMS Annual Conference, Phoenix, Arizona. November 2018.
- P15. **Ho T**, Zabinsky ZB, Fishman PA, Liu S. "Prevention of seasonal influenza outbreak via healthcare insurance." INFORMS Annual Conference, Phoenix, Arizona. November 2018.
- P16. Lin Y, Huang S, **Liu S**. "Designing prognostic-based depression monitoring strategies in cost-effective ways." 40th SMDM Annual Meeting, Montreal, Quebec, Canada, 2018.
- P17. Ho T, **Liu S**, Zabinsky ZB. "Dynamic resource allocation algorithm for population disease management." 40th SMDM Annual Meeting, Montreal, Quebec, Canada, 2018.
- P18. **Gong J**, Simon GE, Liu S. "Machine learning discovery of longitudinal patterns of depression and suicidal ideation." 40th SMDM Annual Meeting, Montreal, Quebec, Canada, 2018. Gong J is a **Lee B. Lusted Prize Finalist**.
- P19. **Gong J** and Liu S. "Partially observable collaborative model for optimizing personalized treatment selection." 40th SMDM Annual Meeting, Montreal, Quebec, Canada, 2018.
- P20. **Ho T**, Liu S, Zabinsky ZB. "Branch-and-bound approach for dynamic resource allocation in population disease management." INFORMS International Conference, Taipei, Taiwan. June 2018.
- P21. **Liu S**. "Pattern recognition, learning, and optimal intervention: models and insights for depression care management." IISE annual conference, Orlando, Florida. May 2018.

- P22. **Gong J**, Simon GE, Liu S. “Machine learning discovery of longitudinal patterns of depression and suicidal ideation.” INFORMS Annual Conference, Houston, Texas. November 2017.
- P23. **Gong J**, Liu S. “Adaptive strategies for personalized treatment selection of depression in a heterogeneous population.” INFORMS Annual Conference, Houston, Texas. November 2017.
- P24. **Lin Y**, Huang S, Liu S. “Cost-effectiveness analysis for prognostic-based depression monitoring.” INFORMS Annual Conference, Houston, Texas. November 2017.
- P25. **Lin Y**, Huang S, Liu S. “Personalizing depression treatment follow-up via rule-based method.” INFORMS Annual Conference, Houston, Texas. November 2017.
- P26. **Ho T**, Liu S, Zabinsky ZB. “Using a branch-and-bound scheme with multi-fidelity models to optimize hepatitis C screening and treatment policies under a budget constraint.” INFORMS Annual Conference, Houston, Texas. November 2017.
- P27. **Liu S**, Huang S, Lin Y, Yang X, Huang J, Shang W. “Depression care management: personalized assessment to cost-effective population interventions.” INFORMS Annual Conference, Nashville, Tennessee. November 2016.
- P28. **Gong J**, Liu S. “A POMDP model for personalized depression monitoring.” INFORMS Annual Conference, Nashville, Tennessee. November 2016.
- P29. **Lin Y**, Liu S, Huang S. “Adaptive monitoring of depression patient population: a data driven approach.” INFORMS Annual Conference, Nashville, Tennessee. November 2016.
- P30. **Lin Y**, Huang S, Liu S. “Patient-specific depression monitoring by selective sensing.” INFORMS Annual Conference, Nashville, Tennessee. November 2016.
- P31. **Cipriano LE**, Liu S, Shahzada KS, Goldhaber-Fiebert JD. “Patient prioritization in disease-specific-treatment budgets: the case of chronic hepatitis c treatment.” 38th SMDM Annual Meeting, Vancouver, BC, Canada, 2016.
- P32. **Lin Y**, Huang S, Liu S. “Adaptive monitoring of depression patient population: a selective sensing approach.” 38th SMDM Annual Meeting, Vancouver, BC, Canada, 2016. **Winner of the Lee B. Lusted student prize.**
- P33. **Lin Y**, Huang S, Liu S. “A longitudinal pattern based prognostic model for depression monitoring via rule-based method.” 38th SMDM Annual Meeting, Vancouver, BC, Canada, 2016. **Lee B. Lusted Prize Finalist.**
- P34. Huang J, **Liu S**. “Analyzing population progression dynamics of depression from electronic health record using a family of Markov models.” 38th SMDM Annual Meeting, Vancouver, BC, Canada, 2016.
- P35. Sheng W, **Liu S**. “Depression management using electronic health record: personalized progression prediction and monitoring.” 38th SMDM Annual Meeting, Vancouver, BC, Canada, 2016.
- P36. Lin Y, **Liu S**, Huang S. “Adaptive monitoring with selective sensing in depression treatment population.” INFORMS International Conference, Hawaii, 2016.
- P37. **Huang H**, Li Y, Zabinsky ZB, Liu S. “Optimal screening and treatment allocation strategy for hepatitis C by simulation optimization.” INFORMS International Conference, Hawaii, 2016.
- P38. **D.J. Feller-Kopman**, S. Liu, A.M. Garner, M. Decamp, J.B. Pietzsch. “Cost-effectiveness of the Percepta bronchial genomic classifier for the diagnostic evaluation of lung cancer: an analytical framework based on the AEGIS studies.” American Thoracic Society International Conference, San Francisco, California, 2016.
- P39. **Gregersen K**, Spector J, Liu S, Veenstra D, Johnson P. “Whole body vibration exposures: using low back and neck claims to assess the cost and health effects of different bus driver seats.” 8th International Scientific Conference on Prevention of Work-Related Musculoskeletal Disorders, PREMUS: Toronto, CA, 2016.

- P40. Lin Y, Huang S, **Liu S**. “Analysis of depression trajectory patterns using collaborative learning.” 37th SMDM Annual Meeting, St. Louis, Missouri, 2015.
- P41. **Li Y**, Zabinsky ZB, Huang H, Liu S. “Optimizing hepatitis C screening and treatment allocation strategy.” INFORMS Annual Meeting, Philadelphia, Pennsylvania, 2015.
- P42. **Lin Y**, Liu S, Huang S. “Large-scale personalized health surveillance by selective sensing.” INFORMS Annual Meeting, Philadelphia, Pennsylvania, 2015.
- P43. **Lin Y**, Huang S, Liu S. “Analysis of electronic health record based depression trajectory and monitoring.” INFORMS Annual Meeting, Philadelphia, Pennsylvania, 2015.
- P44. Noblett KL, Dmochowski RR, Vasavada SP, Garner AM, Liu S, **Pietzsch JB**. “Cost profile of rechargeable vs. non-rechargeable neuromodulation devices in the treatment of overactive bladder syndrome.” North American Neuromodulation Society (NANS) Annual Meeting, Las Vegas, Nevada, 2015.
- P45. Lin Y, **Liu S**, Huang S. “Large-scale personalized health surveillance by selective sensing.” INFORMS Healthcare Conference, Nashville, Tennessee, 2015.
- P46. Lin Y, Huang S, **Liu S**. “Development and analysis of electronic health record based depression trajectory and monitoring.” INFORMS Healthcare Conference, Nashville, Tennessee, 2015.
- P47. Feeley BT, Liu S, Garner AM, Zhang AL, **Pietzsch JB**. “The cost-effectiveness of meniscal repair versus partial meniscectomy: a model-based projection of clinical outcomes and costs in the United States Healthcare System.” ISPOR 20th Annual International Meeting, Philadelphia, Pennsylvania, 2015.
- P48. **Liu S**, Watcha D, Holodniy H, Goldhaber-Fiebert JD. “Cost-effectiveness of hepatitis C treatment delivery in U.S. incarcerated populations.”
a. Health Systems Optimization Workshop, Chicago, Illinois, 2014.
b. 36th SMDM Annual Meeting, Miami, Florida, 2014.
c. INFORMS Annual Meeting, San Francisco, California, 2014.
d. SMDM 15th Biennial European Meeting, Antwerp, Belgium, 2014. (Presenter: **Goldhaber-Fiebert**)
- P49. **Pietzsch JB**, Liu S, Kezirian EJ, Strollo PJ. “Long-term cost-effectiveness of upper airway stimulation for the treatment of obstructive sleep apnea - a model-based projection based on the STAR trial.” 28th Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, Minnesota, 2014.
- P50. **Cipriano LC**, Liu S, **Goldhaber-Fiebert J**. “optimal information collection policies in a Markov decision process framework.”
a. Production and Operations Management Society (POMS) 25th Annual Conference, Atlanta, Georgia, 2014. (Presenter: Cipriano)
b. 35th SMDM Annual Meeting, Baltimore, Maryland, 2013. (Presenter: Goldhaber-Fiebert)
- P51. **Liu S**, Brandeau M, Goldhaber-Fiebert J. “Optimizing patient treatment decisions in an era of rapid technological advances.”
a. INFORMS Annual Meeting, Minneapolis, Minnesota, 2013.
b. 35th SMDM Annual Meeting, Baltimore, Maryland, 2013.
- P52. **Liu S**, Cipriano LE, Holodniy M, Goldhaber-Fiebert JD. “Cost-effectiveness of risk-factor guided and universal screening for chronic hepatitis C.”
a. INFORMS Annual Meeting, Phoenix, Arizona, 2012.
b. INFORMS International Meeting, Beijing, China, 2012.
c. INFORMS Annual Meeting, Charlotte, North Carolina, 2011.
d. 33rd SMDM Annual Meeting, Chicago, Illinois, 2011.
- P53. **Liu S**, Cipriano LE, Goldhaber-Fiebert JD. “Combining regression analyses and Markov models to infer age-specific mortality rates by hepatitis C infection and risk factor status.”
a. International Conference on Smart Health (ICSH), Beijing, China, 2014

- b. 34th SMDM Annual Meeting, Phoenix, Arizona, 2012.
- P54. **Liu S**, Cipriano LE, Goldhaber-Fiebert JD. “With more effective therapies, should we screen for chronic hepatitis C in the US?” 33rd SMDM Annual Meeting, Chicago, Illinois, 2011.
- P55. **Liu S**, Schwarzwinger M, Carrat F, Goldhaber-Fiebert JD. “Cost-effective alternatives to liver biopsy in the management of chronic hepatitis C.”
 - a. INFORMS Annual Meeting, Austin, Texas, 2010.
 - b. 32nd SMDM Annual Meeting, Toronto, Canada, 2010.
- P56. **Liu S**. “Envisioning the future of optoelectronic interconnects.” Plenary session speaker. Communication Technology Roadmap Spring Meeting, Road to High Volume Photonics. MIT, Cambridge, MA, 2007.

Professional society memberships

1. Institute for Operation Research and the Management Sciences (INFORMS), membership 2011-present.
2. Society for Medical Decision Making (SMDM), membership 2011-present.
3. Institute of Industrial and Systems Engineers (IISE), membership 2016-2017.
4. Tau Beta Pi Engineering Honor Society, 2003-present.

Editorial Board

Healthcare Management Science, editorial board member, 2019-2023
Healthcare Management Science, associate editor, 2020-2023

Invited Reviewer

National Science Foundation CMMI Grant Panel Reviewer, March 2020

Journals:

Operations Research, European Journal of Operational Research, Medical Decision Making, IIE Transactions on Healthcare Systems Engineering, The International Journal of Management Science, Hepatology, Annals of Internal Medicine (top rated reviewer of 2014-2016), Applied Health Economics and Health Policy, PharmacoEconomics, Journal of Public Health Policy, PLoS ONE, Public Health Reports, The Engineering Economist, Health Care Management Science, IEEE Transactions on Automation Science and Engineering, Annals of Operations Research, IIE Transactions, Simulation, INFORMS Journal on Computing, Decision Analysis, Production & Operations Management, Scientific Reports, PLOS Medicine.

GRADUATE STUDENTS

Chaired Doctoral Degrees

1. Ying Lin, Co-chair with Shuai Huang, Thesis title *Large-Scale Personalized Health Surveillance by Collaborative Learning and Selective Sensing*, Summer 2017.
2. Jue Gong, Chair, Thesis title *Optimizing Personalized Treatment Selection for Partially Observable Chronic Conditions*, Spring 2019.
3. TingYu Ho, Co-chair with Zelda B. Zabinsky, Thesis title *Optimizing Healthcare Policies through Healthcare Delivery and Insurance Design*, Spring 2019.
- 4.

Current Doctoral Students

1. Mutita Siriruchatanon, Chair, passed qualifying exam Winter 2018
2. Serin Lee, Co-chair with Zelda B. Zabinsky
3. Xiaonan Sun, Chair

Chaired Masters Degrees

1. Jiaqi Huang, Chair, Thesis title *Modeling Depression Progression Dynamics from Electronic Health Record*, Spring 2016.
2. Xuelu Yang, Chair, Thesis title *Cost-Effectiveness Analysis of Adaptive Monitoring Strategies for Depression Treatment*, Spring 2016.
3. Weiwei Sheng, Chair, Thesis title *Depression Management Using Electronic Health Record: Individual Progression Prediction*, Spring 2016.
4. Yuankun Li, Chair, Thesis title *Optimizing Hepatitis C Birth-Cohort Screening and Treatment Allocation Strategy*, Summer 2015.

Doctoral Supervisory Committee Member: Xi Zhu (Civil), Hao-Hsiang Wu, Fangfang Wang, Mahshid Salemi Parizi, Ali Ajdari, Jing Yan, Tolu Abe, Xiao Cao

Doctoral Supervisory Committee Graduate School Representative: Yohan Min (CBE), Yiming Zhang (Foster, OM), Xiasen Wang (Civil), Wisal Hassan (Global Health), Samantha Dolan (Global Health), Kevin Lybarger (EE), Yuankun Li (Foster, OM), Anne Njoroge (Global Health), Shahryar Doosti (Foster, OM), Mohammad Ebrahim Arbabian (Foster, OM), Ting Qiu (EE), Danying Hu (EE), Louis Gong (ME)

Postdoctoral Mentoring Committee Member: Anjuli Wagner (Epidemiology, NSF fellowship)

Faculty Resource Mentor: Horacio Duarte (Medicine, Pediatrics Infectious Disease), Rebecca Maine (Medicine, Surgery), Douglas Barthold (Pharmacy), Sigrid Collier (Medicine, Dermatology)

Master Thesis Committee Member: Kat Gregersen (EOH), Archana Nandakumar

Graduate Independent Studies Advisor: Dorrit Ding, Zahra Ghatrani, Sevnaz Nourollahi, Wei Guo

Undergraduate Research Advisor: Rui Wei, Qian Chu, Elfira Wahono, Mengzhen Yuan

RESEARCH ACTIVITIES

Funded Research

Funding Agency	Title	Your role with other PI's and co-PI's	Total Amount	Dates (start - finish)
NIH R21	<i>Using systems science to optimize the impact of point-of-care viral load testing for pediatric HIV management</i>	Co-Investigator (PI: Rena Patel)	\$421,007	4/20-4/22
SMDM CDMI Initiative	<i>Optimizing Societal Reopening Plans and Vaccine Distribution Strategies under COVID-19 using Simulation Optimization Modelling Tools</i>	PI (co-investigator: Zelda Zabinsky, Shi Chen, Judith Wasserheit, Jennifer Ross, UW)	\$32,745	7/2020 – 12/2020

NSF CMMI 1935403 supplemental support	<i>Improving Covid-19 Pandemic Response by Integrating Queuing Theory with Infectious Disease Models</i>	PI (PI on parent grant, Zelda Zabinsky, UW; NCSU PI, Yunan Liu)	\$83,886	8/2020 – 1/2021
UW Population Health Initiative	<i>Ensuring equal access to trauma care in Washington State through system modeling</i>	Investigator (Lead-Investigator, Rebecca Maine)	\$50,000	5/2020 – 4/2021
NSF CMMI 1935403	<i>Optimizing Vaccination Incentives to Prevent Disease Outbreaks</i>	Co-PI (PI, Zelda Zabinsky)	\$419,477	1/2020- 12/2022
NSF CMMI 1824623	<i>An Integrated Decision Framework for Depression and Suicide Ideation Monitoring</i>	PI (co-PI, Shuai Huang, UW)	\$463,229	9/2018 – 8/2022
NIOSH (U19 – Oregon Health and Science University)	<i>Engineering and Behavioral Controls for Truck Drivers' Sleep, Safety, and Health</i>	Co-Investigator (PI: Peter Johnson, UW)	\$380,159	2016 – 2021
NSF CMMI 1536407	<i>Decision Model for Patient-Specific Motion Management in Radiation Therapy Planning</i>	Co-PI (PI: Wanpracha Chaovalitwongse, UW)	\$184,758	9/2015 – 6/2018
UW Royalty Research Fund	<i>Development and Analysis of Electronic Health Record Based Depression Screening and Monitoring Strategies</i>	PI (co-PI, Shuai Huang, UW)	\$39,997	6/2015 – 6/2016
US Department of Veteran Affairs (IIR 12-059)	<i>Cost-effective Uses of New Hepatitis C Treatments and their VA Budgetary Impact</i>	UW PI/IPA (PI: Douglas Owens, Stanford University)	\$30,881	6/2014 – 9/2015

TEACHING

1. IND E 250: Fundamentals of Engineering Economy
2. IND E 411: Stochastic Models & Decision Analysis
3. IND E 519: Healthcare Modeling and Decision Making

SERVICE

Department

- Graduate Admission Committee, 2014-2016, 2019-2020
- MISE Admission Committee, 2016-2017
- Undergraduate Admission/Scholarship/Curriculum Committee, 2016-2020
- Departmental seminar organizer, Spring 2016
- Departmental Seminar Committee, 2017-2019
- Engineering Discovery Day, 2014, 2015
- Undergraduate Advising Committee, 2013-2014
- Senior design capstone project competition judge, 2014-2016

College

- College of Engineering Council on Education Policy, 2015-2019
- COE Faculty Committee for Admissions and Enrollment, 2018-2019
- The Washington State Academic RedShirt (STARS) program faculty mentor, 2016, 2019

University

- Faculty Senator, 2016-2018
- UW Royalty Research Fund reviewer, 2015, 2016
- UW Center for AIDS Research (CFAR) Public Health and Implementation Science Core Advisory Group member, 2016-present
- UW Math Academy presenter, summer 2018

Professional society

- INFORMS Anaheim 2021, organizing committee member; Contributed Sessions planning committee member
- INFORMS Seattle 2019, organizing committee member; co-chair for Interactive Session
- Session chair at INFORMS: Virtual 2020, Healthcare Boston 2019, Phoenix 2018, Houston 2017, International Hawaii 2016, Philadelphia 2015, Healthcare Nashville 2015, San Francisco 2014, Minneapolis 2013, International Beijing 2012
- INFORMS Health Application Society (HAS) Student Paper Contest judge 2017, 2019
- INFORMS Section on Public Programs, Services and Needs (SPPSN) Best Paper Award judge 2014
- SMDM annual conference abstract reviewer, 2011-2019
- SMDM annual meetings, invited judge, Lee B. Lusted student research prize competition, 2018, 2020