Gian-Gabriel Garcia

Assistant Professor
H. Milton Stewart School of Industrial and Systems Engineering
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I.   Earned Degrees

University of Michigan, Ann Arbor, MI
PhD, Industrial and Operations Engineering   8/2020
MS, Industrial and Operations Engineering   12/2016

University of Pittsburgh, Pittsburgh, PA
BS, Industrial Engineering, *Summa Cum Laude*   12/2014

II.   Employment History

Georgia Institute of Technology, Atlanta, GA
Assistant Professor   8/2021-Present
H. Milton Stewart School of Industrial and Systems Engineering

Harvard Medical School, Boston, MA
Postdoctoral Fellow   7/2020-7/2021
Massachusetts General Hospital Institute for Technology Assessment

III.   Honors and Awards

A.   International or National Awards

Panel Fellow for NSF CMMI Game Changer Academies	2022
SMDM Lee B. Lusted Prize in *Quantitative Methods & Theoretical Developments*	2020
INFORMS Minority Issues Forum Paper Competition	2020
SMDM Lee B. Lusted Prize in *Quantitative Methods & Theoretical Developments*	2018
INFORMS Bonder Scholarship for Applied OR in Health Services	2018
INFORMS Minority Issues Forum Doctoral Colloquium Sponsorship	2018
INFORMS Minority Issues Forum Poster Competition - First Place	2017
INFORMS Bonder Scholarship for Applied OR in Health Services - Finalist	2017
NSF Graduate Research Fellowship	2017-2020
Ford Foundation Fellowship Predoctoral Competition - Honorable Mention	2016, 2017

B. Institute or School Awards

University of Michigan, Ann Arbor, MI

Towner Prize for Distinguished Academic Achievement	2020
Cornell ORIE Young Researchers Workshop - Departmental Nomination	2019
IOE Graduate Student Instructor of the Semester	Winter 2017
IOE Bonder Scholar Fellowship - Honorable Mention	2016
Rackham Merit Fellowship	2015-2020

IV. Research, Scholarship, and Creative Activities

* indicates work conducted at Georgia Tech.
Student coauthors advised/mentored by Dr. Garcia at Georgia Tech appear in **bold**.
Student coauthors supervised/mentored by Dr. Garcia outside of Georgia Tech appear in *italics*.

A. Academic Publications

A.1. Published and Accepted Journal Articles

J12. C. DiGennaro, G.-G. P. Garcia, E. J. Stringfellow, S. Wakeman, and M. S. Jalali (2021). Changes in characteristics of drug overdose death trends during the COVID-19 pandemic. *International Journal of Drug Policy* **98**(Accepted), 103392.

J11. G.-G. P. Garcia, *C. M. Schumb*, M. S. Lavieri, H. Koffijberg, T. W. McAllister, M. A. McCrea, and S. P. Broglio (2021). Developing Insights for Possible and Probable Acute Concussions Using Cluster Analysis. *Journal of Neurotrauma* (Accepted), neu.2020.7399.

J10. *L. L. Czerniak*, S. W. Liebel, G.-G. P. Garcia, M. S. Lavieri, M. A. McCrea, T. W. McAllister, and S. P. Broglio (2021). Sensitivity and Specificity of Computer-Based Neurocognitive Tests in Sport-Related Concussion: Findings from the NCAA-DoD CARE Consortium. *Sports Medicine* **51**(2), 351–365.

J9. S. W. Liebel, K. Van Pelt, G.-G. P. Garcia, *L. L. Czerniak*, M. A. McCrea, T. W. McAllister, and S. P. Broglio (2020). The Relationship between Sport-Related Concussion and Sensation-Seeking. *International Journal of Molecular Sciences* **21**(23), 9097.

J8. G.-G. P. Garcia, *J. Yang*, M. S. Lavieri, T. W. McAllister, M. A. McCrea, and S. P. Broglio (2020). Optimizing Components of the Sport Concussion Assessment Tool for Acute Concussion Assessment. *Neurosurgery* **87**(5), 971–981.

J7. G.-G. P. Garcia, M. S. Lavieri, R. Jiang, M. A. McCrea, T. W. McAllister, and S. P. Broglio (2020). Data-driven stochastic optimization approaches to determine decision thresholds for risk estimation models. *IISE Transactions* **52**(10), 1098–1121.

- Winner, 2020 INFORMS Minority Issues Forum Paper Competition
- Winner, 2018 SMDM Lee B. Lusted Prize in Quantitative Methods and Theoretical Developments
- First Place, 2017 INFORMS Minority Issues Forum Poster Competition

J6. G.-G. P. Garcia, M. S. Lavieri, C. Andrews, X. Liu, M. P. Van Oyen, M. A. Kass, M. O. Gordon, and J. D. Stein (2019). Accuracy of Kalman Filtering in Forecasting Visual Field and Intraocular Pressure Trajectory in Patients With Ocular Hypertension. *JAMA Ophthalmology* **137**(12), 1416–1423.

J5. G.-G. P. Garcia, M. S. Lavieri, R. Jiang, T. W. McAllister, M. A. McCrea, and S. P. Broglio (2019). A Data-Driven Approach to Unlikely, Possible, Probable, and Definite Acute Concussion Assessment. *Journal of Neurotrauma* **36**(10), 1571–1583.

J4. G.-G. P. Garcia, K. Nitta, M. S. Lavieri, C. Andrews, X. Liu, *E. Lobaza*, M. P. Van Oyen, K. Sugiyama, and J. D. Stein (2019). Using Kalman Filtering to Forecast Disease Trajectory for Patients With Normal Tension Glaucoma. *American Journal of Ophthalmology* **199**, 111–119.

J3. G. J. Schell, G.-G. P. Garcia, M. S. Lavieri, J. B. Sussman, and R. A. Hayward (2019). Optimal Coinsurance Rates for a Heterogeneous Population under Inequality and Resource Constraints. *IISE Transactions* **51**(1), 74–91.

J2. G.-G. P. Garcia, S. P. Broglio, M. S. Lavieri, M. McCrea, and T. McAllister (2018). Quantifying the Value of Multidimensional Assessment Models for Acute Concussion: An Analysis of Data from the NCAA-DoD Care Consortium. *Sports Medicine* **48**(7), 1739–1749.

J1. M. H. Mofrad, G.-G. P. Garcia, L. M. Maillart, B. A. Norman, and J. Rajgopal (2016). Customizing Immunization Clinic Operations to Minimize Open Vial Waste. *Socio-Economic Planning Sciences* **54**(March 2016), 1–17.

A.2. Other Refereed Material

Refereed Conference Abstracts

O6. G.-G. P. Garcia, M. S. Lavieri, T. W. McAllister, M. A. McCrea, and S. P. Broglio (2020). The Value of Incorporating Symptom-Reporting Behavior in Optimal Treatment Decisions: An Application to Return-to-Play from Sports-Related Concussion. *Society of Medical Decision Making 42nd Annual Meeting*, Chicago, IL

O5. G.-G. P. Garcia, M. S. Lavieri, C. Andrews, X. Liu, M. P. Van Oyen, M. A. Kass, M. O. Gordon, and J. D. Stein (2019). Using a Machine Learning Technique Called Kalman Filtering to Forecast Conversion from Ocular Hypertension to Primary Open Angle Glaucoma. *The Association for Research in Vision and Ophthalmology*, Vancouver, BC

O4. G.-G. P. Garcia, M. S. Lavieri, R. Jiang, M. A. McCrea, T. W. McAllister, and S. P. Broglio (2018). A Novel Data-Driven Framework for Improving Risk-Based Medical Diagnosis with Application to Acute Concussion Assessment. *Society of Medical Decision Making 40th Annual Meeting*, Montreal, QC

O3. M. S. Lavieri, X. Liu, G.-G. P. Garcia, *Z. Zhou*, *E. Lobaza*, J. Wang, K. Sugiyama, K. Nitta, C. Andrews, M. P. Van Oyen, and J. D. Stein (2017). Using Kalman Filtering to Personalize the Monitoring of Persons with Normal Tension Glaucoma. *The Association for Research in Vision and Ophthalmology*, Baltimore, MD

O2. G.-G. P. Garcia, M. S. Lavieri, and S. P. Broglio (2017). A Markov Decision Process to Model Symptom Self-Reporting Behavior in Concussion Management. *The 3rd Multidisciplinary Conference on Reinforcement Learning and Decision Making*, Ann Arbor, MI

O1. G.-G. P. Garcia, M. S. Lavieri, and S. P. Broglio (2016). Quantifying Risk Thresholds for On-field Concussion Diagnosis. *Industrial and Systems Engineering Research Conference*, Anaheim, CA

A.3. Submitted Journal Articles (with Date of Submission)

R4. *G.-G. P. Garcia, *R. Dehghanpoor*, E. J. Stringfellow, *M. Gupta*, *J. Rochelle*, *E. Mason*, T. Pujol, and M. S. Jalali (2021). Identifying Advice-Seekers for Suboxone Use on Reddit via Social Network Characteristics and Suboxone Use Stage. *medrXiv* (Submitted). arXiv: 2021.08.25.21262427v1 [10.1101]

- Pre-print: https://www.medrxiv.org/content/10.1101/2021.08.25.21262427v1
- Garcia and Dehghanpoor have equal contributions as authors

R3. *G.-G. P. Garcia, E. J. Stringfellow, C. DiGennaro, *N. Poellinger*, *J. Wood*, S. E. Wakeman, and M. S. Jalali (2021). Emerging and Continuing Trends in Opioid Overdose Decedent Characteristics during COVID-19. (Submitted)

- Pre-print: https://www.medrxiv.org/content/10.1101/2021.07.28.21261276v1

R2. *J. B. Caccese, G.-G. P. Garcia, A. P. Kontos, N. L. Port, K. Valerio, S. P. Broglio, M. A. McCrea, T. W. McAllister, P. F. Pasquina, and T. A. Buckley (2021). Test-Retest Reliability and Efficacy of Individual Symptoms in Concussion Management. (Under revision)

R1. *G.-G. P. Garcia, L. N. Steimle, W. J. Marrero, and J. B. Sussman (2021). An Analysis of Structured Optimal Policies for Hypertension Treatment Planning: The Tradeoff Between Optimality and Interpretability. (Under revision).

- Pre-print: http://www.optimization-online.org/DB_HTML/2021/08/8539.html

A.4. Articles in Preparation

P5. *G.-G. P. Garcia, M. S. Lavieri, T. W. McAllister, M. A. McCrea, and S. P. Broglio (2021). Estimating the Value of Incorporating Patient Behavior in Return-to-play from Concussion. (In Preparation)

- Winner, 2020 SMDM Lee B. Lusted Prize in Quantitative Methods and Theoretical Developments

P4. *G.-G. P. Garcia, M. S. Lavieri, S. W. Liebel, K. Van Pelt, T. W. McAllister, M. A. McCrea, S. P. Broglio, and CARE Consortium Investigators (2021). Tailoring the Symptom-Free Waiting Period in Return-to-Play from Concussion: A Simulation Analysis Using CARE Consortium Data. (Working Paper)

P3. *G.-G. P. Garcia, N. Ghaffarzadegan, and M. S. Jalali (2021). Analyzing "Optimal" Diagnosis Policies for Post-traumatic Stress Disorder in the Presence of Social Stigma. (Working Paper)

P2. *_L. L. Czerniak_, S. W. Liebel, H. Zhou, G.-G. P. Garcia, M. S. Lavieri, M. A. McCrea, T. W. McAllister, S. P. Broglio, and CARE Consortium Investigators (2021). Sensitivity and Specificity of the ImPACT Neurocognitive Test in Collegiate Athletes and United States Military Cadets with ADHD and/or LD: Findings from the NCAA-DoD CARE Consortium. (In Preparation)

P1. ***C.-Y. Liao**, G.-G. P. Garcia, C. DiGennaro, and M. S. Jalali (2021). Data Aggregation Obscures Racial Disparities in Opioid Overdose Deaths: A Call to Improve Data Reporting Practices. (In Preparation)

B. Presentations

B.1. Invited Conference and Workshop Presentations

13. *G.-G. P. Garcia, L. N. Steimle, and W. J. Marrero (2021). An Analysis of Structured Optimal Policies for Hypertension Treatment Planning: The Tradeoff Between Optimality and Interpretability. _INFORMS Annual Meeting_, Anaheim, CA

12. *G.-G. P. Garcia, M. S. Lavieri, T. W. McAllister, M. A. McCrea, and S. P. Broglio (2021). Estimating the Value of Incorporating Patient Behavior in Return to Play from Concussion. _INFORMS Annual Meeting_ (Bonder Scholars Session), Anaheim, CA

11. G.-G. P. Garcia, C. DiGennaro, E. J. Stringfellow, _J. Wood_, _N. Poellinger_, and M. S. Jalali (2021). A Multi-state Analysis of Opioid Overdose Death Trends Since the Onset of COVID-19. _INFORMS Healthcare_ (Invited Session), Virtual Meeting

10. G.-G. P. Garcia, L. N. Steimle, and W. J. Marrero (2021). An Analysis of Structured Optimal Policies for Hypertension Treatment Planning. _INFORMS Healthcare_ (Bonder Scholars Session), Virtual Meeting

9. G.-G. P. Garcia, M. S. Lavieri, T. W. McAllister, M. A. McCrea, and S. P. Broglio (2020). The Value of Incorporating Symptom-Reporting Behavior in Return-to-play from Concussion. _INFORMS Annual Meeting_ (Bonder Scholars Session), National Harbor, MD

8. G.-G. P. Garcia, M. S. Lavieri, and S. P. Broglio (2019). Optimizing Treatment Decisions Under Strategically Reported Symptoms. _INFORMS Annual Meeting_ (Bonder Scholars Session), Seattle, WA

7. G.-G. P. Garcia, M. S. Lavieri, R. Jiang, T. W. McAllister, M. A. McCrea, and S. P. Broglio (2019). Data-driven Stochastic Optimization Approaches to Determine Decision Thresholds for Risk Estimation Models. _INFORMS Annual Meeting_ (Invited Session), Seattle, WA

6. G.-G. P. Garcia, _J. Yang_, M. S. Lavieri, T. W. McAllister, M. A. McCrea, and S. P. Broglio (2019). Doing More with Less: Applying Modern Predictive Modeling Methods to Improve Acute Concussion Assessment. _INFORMS Healthcare_ (Bonder Scholars Session), Boston, MA

5. G.-G. P. Garcia, M. S. Lavieri, T. W. McAllister, M. A. McCrea, and S. P. Broglio (2019). Optimizing Treatment Decisions Under Objective Clinical Measures and Strategically Reported Symptoms. _INFORMS Healthcare_ (Invited Session), Boston, MA

4. G.-G. P. Garcia, M. S. Lavieri, and S. P. Broglio (2018). Optimization Approaches for Concussion Management Decisions. *INFORMS Annual Meeting* (Invited Session), Phoenix, AZ

3. G.-G. P. Garcia, M. S. Lavieri, and S. P. Broglio (2018). Data-driven Optimization Models for Concussion Management Decisions. *INFORMS Annual Meeting* (Bonder Scholars Session), Phoenix, AZ

2. G.-G. P. Garcia, M. S. Lavieri, R. Jiang, M. McCrea, T. W. McAllister, S. P. Broglio, and CARE Consortium Investigators (2017). A Novel Framework to Determine Decision Thresholds for Medical Diagnosis. *INFORMS Annual Meeting* (Invited Session), Houston, TX

1. G.-G. P. Garcia, M. S. Lavieri, and S. P. Broglio (2016). An Optimization Approach to Concussion Management. *INFORMS Annual Meeting* (Invited Session), Nashville, TN

B.2. Conference and Workshop Presentations

2. *C. G. Turner*, A. Svirsko, G.-G. P. Garcia, and S. W. Liebel (2021). Temporal Network Architectures of Neurocognitive and Psychological Symptoms in Collegiate Athletes with Sports-related Concussion. *INFORMS Annual Meeting*, Anaheim, CA

1. G.-G. P. Garcia, M. S. Lavieri, R. Jiang, T. W. McAllister, M. A. McCrea, and S. P. Broglio (2019). Data-driven Stochastic Optimization Approaches to Determine Decision Thresholds for Risk Estimation Models. *ORIE Young Investigators Workshop*, Cornell University

B.3. Invited Seminar Presentations

4. *An Analysis of Structured Optimal Policies for Hypertension Treatment Planning: The Tradeoff Between Optimality and Interpretability

  • Department of Industrial and Systems Engineering, Virginia Tech, November 2021

3. Predictive and Prescriptive Analytics for Concussion Management Decisions

  • MGH Institute for Technology Assessment, Harvard Medical School, August 2020
  • Department of Industrial and Systems Engineering, University of Minnesota, January 2020
  • Department of Industrial Engineering, Clemson University, January 2020
  • School of Industrial Engineering and Regenstrief Center for Healthcare Engineering, Purdue University, December 2019
  • H. Milton Stewart School of Industrial and Systems Engineering, Georgia Institute of Technology, December 2019
  • Department of Industrial and Systems Engineering, University of Florida, December 2019

2. Data-driven Decision Thresholds for Risk Estimation Models with Application to Acute Concussion Assessment

- Edward P. Fitts Department of Industrial & Systems Engineering Department, North Carolina State University, April 2019

1. Data-driven Optimization for Concussion Management Decisions

  - Department of Industrial and Operations Engineering, University of Michigan, September 2018

B.4.   Other Presentations

11. *L. L. Czerniak*, S. W. Liebel, G.-G. P. Garcia, M. S. Lavieri, M. A. McCrea, T. W. McAllister, and S. P. Broglio (2020). Sensitivity and Specificity of Computer-Based Neurocognitive Assessments in Sport-Related Concussion. *Traumatic Brain Injury Conference*, Washington D.C.

10. *L. L. Czerniak*, S. W. Liebel, G.-G. P. Garcia, M. S. Lavieri, M. A. McCrea, T. W. McAllister, and S. P. Broglio (2020). Characterizing the Accuracy of Computer-Based Neurocognitive Tests in Sport-Related Concussion. *INFORMS Annual Meeting Minority Issues Forum Poster Competition*, National Harbor, MD

9. G.-G. P. Garcia, *J. Yang*, M. S. Lavieri, T. W. McAllister, M. A. McCrea, and S. P. Broglio (2019). Optimization of the SAC, BESS, and SCAT Symptom Checklist for Acute Concussion Assessment. *Traumatic Brain Injury Conference*, Washington D.C.

8. G.-G. P. Garcia, M. S. Lavieri, *C. M. Schumb*, T. W. McAllister, M. A. McCrea, and S. P. Broglio (2018). Developing Insights For Hard-to-Diagnose Concussions Using Machine Learning. *INFORMS Annual Meeting Minority Issues Forum Poster Competition*, Phoenix, AZ

7. G.-G. P. Garcia, M. S. Lavieri, R. Jiang, M. McCrea, T. W. McAllister, S. P. Broglio, and CARE Consortium Investigators (2018). A Stochastic Programming Approach to Determine Decision Boundaries for Medical Diagnosis. *YinzOR Conference* **3rd Place**, Carnegie Mellon University, Pittsburgh, PA

6. M. S. Lavieri, X. Liu, G.-G. P. Garcia, *Z. Zhou*, *E. Lobaza*, J. Wang, K. Sugiyama, K. Nitta, C. Andrews, M. P. Van Oyen, and J. D. Stein (2017). Using Kalman Filtering to Personalize the Monitoring of Persons with Normal Tension Glaucoma. *The Association for Research in Vision and Ophthalmology*, Baltimore, MD

5. G.-G. P. Garcia, M. S. Lavieri, R. Jiang, M. McCrea, T. W. McAllister, S. P. Broglio, and CARE Consortium Investigators (2017). A Stochastic Programming Approach to Determine Decision Boundaries for Medical Diagnosis. *Center for Healthcare Engineering and Patient Safety Symposium*, University of Michigan, Ann Arbor, MI

4. G.-G. P. Garcia, M. S. Lavieri, R. Jiang, M. McCrea, T. W. McAllister, S. P. Broglio, and CARE Consortium Investigators (2017). A Stochastic Programming Approach to Determine Decision Boundaries for Medical Diagnosis. *Engineering Graduate Symposium* **2nd Place**(Session IOF-2), University of Michigan, Ann Arbor, MI

3. G.-G. P. Garcia, M. S. Lavieri, R. Jiang, M. Mccrea, T. W. McAllister, S. P. Broglio, and CARE Consortium Investigators (2017). A Stochastic Programming Approach to Determine Decision Boundaries for Medical Diagnosis. *INFORMS Annual Meeting Minority Issues Forum Poster Competition* **1st Place**, Houston, TX

2. G.-G. P. Garcia, M. S. Lavieri, and S. P. Broglio (2016). Optimal Return-to-Play From Concussion. *Center for Healthcare Engineering and Patient Safety Symposium*, University of Michigan, Ann Arbor, MI

1. G.-G. P. Garcia, M. S. Lavieri, and S. P. Broglio (2016). Optimal Return-to-Play From Concussion. *Engineering Graduate Symposium*, University of Michigan, Ann Arbor, MI

V. Teaching

A. Courses Taught

Semester, Year	Course Number	Course Title	Number of Students
Spring 2022	IsyE 3232	Stochastic Manufacturing and Service Systems	60
Spring 2022	ISyE 8803	Special Topics: Prediction Modeling in Medical Decision Making and Health Policy	13

B. Individual Student Guidance

B.1. Ph.D. Students

B.1.a. In Process Ph.D. Students

3. Kelsey Custodio
Advising Start Date: Fall 2021

2. Che-Yi Liao
Advising Start Date: Fall 2021

1. Sun Ju Lee
Advising Start Date: Fall 2020
Passed OR Comprehensive Exam in: 2021

VI. Service

A. Professional Contributions

A.1. Society Officers, Activities, and Membership

- Award Committees:

1. Member of INFORMS Minority Issues Forum Best Paper Award committee 2021
2. Member of INFORMS Seth Bonder Scholarship for Applied Operations Research in Health Services committee 2021

- Membership:

  3. INFORMS: Institute for Operations Research and Management Science
  2. SMDM: Society for Medical Decision Making
  1. IISE: Institute of Industrial and Systems Engineering

- Conference Session Chair:

  3. INFORMS Annual Meeting, 2017, 2020
  2. INFORMS Healthcare, 2019, 2021
  1. ISERC, 2016

- Mentoring:

  1. INFORMS Annual Meeting AMAZON SCOT Mentorship Program, 2021

A.2.   Technical Journal or Conference Referee Activities

- Technical Journal Referee:

  7. European Journal of Operational Research
  6. Healthcare Management Science
  5. INFORMS Journal on Computing
  4. Management Science
  3. Manufacturing & Service Operations Management
  2. Medical Decision Making
  1. Operations Research

- Medical Journal Referee:

  9. American Journal of Public Health
  8. Applied Neuropsychology: Adult
  7. BMJ Open Sport & Exercise Medicine
  6. BMC Medical Research Methodology
  5. International Journal of Sports Medicine
  4. JAMA Network Open
  3. Journal of Athletic Training
  2. Neurosurgery
  1. The Clinical Neuropsychologist