

# Yu Ma

Operations Research Center, MIT, Cambridge, 02141 MA  
Personal Website: <https://www.mit.edu/~midsumer/>  
310-648-4625 | midsumer@mit.edu (only one m)

## EDUCATION

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<b>Massachusetts Institute of Technology</b> <i>Ph.D. Candidate in Operations Research</i> <ul style="list-style-type: none"><li>• Advisor: Dimitris Bertsimas</li><li>• Dissertation Area: Artificial Intelligence for System Medicine: Methods and Applications</li></ul>	2020 – 2025 (Expected) <i>Cambridge, MA</i>
<b>University of California, Berkeley</b> <i>Bachelor of Arts in Applied Mathematics</i> <ul style="list-style-type: none"><li>• Highest Honor, Phi Beta Kappa Honor Society</li></ul>	2016 – 2020 <i>Berkeley, CA</i>

## RESEARCH INTERESTS

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Operations Research, Business Analytics, Artificial Intelligence, Healthcare Management.

PAPERS (\* INDICATES FIRST OR LEAD PHD AUTHOR. † INDICATES THE 5-YEAR OR LATEST IMPACT FACTOR FOR MEDICAL JOURNALS. ‡ INDICATES STUDENT I MENTORED.)

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### *Integrative Artificial Intelligence:*

- [1] M3H: Multimodal Multitask Machine Learning for Healthcare ([link](#))  
Dimitris Bertsimas, **Yu Ma\***  
Submitted to *Nature Communications* (IF: 14.7)
  - ★ Oral Presentation (8% acceptance) at NeurIPS workshop of AIM-FM: Advancements In Medical Foundation Models: Explainability, Robustness, Security, and Beyond
  - ★ Implemented at Hartford Hospital, the largest hospital system in Connecticut
  - ★ Winner of INFORMS DMDA Workshop Best Paper (Applied Track)
  - ★ Third best talk at CMU YinzOR Flash Talk Competition
- [2] Integrated Multimodal Artificial Intelligence Framework for Healthcare Applications ([link](#))  
(contribution) Luis R. Soenksen\*, **Yu Ma\***, et al.  
*npj Digital Medicine* (IF: 15.2), 2022
  - ★ Implemented at Hartford Hospital, the largest hospital system in Connecticut
  - ★ Cognex Prize at MIT Machine Intelligence for Manufacturing and Operations (MIMO) Symposium

### *Responsible Optimization and Machine Learning:*

- [3] Robust Regression under Averaged Uncertainty Set ([link](#))  
Dimitris Bertsimas, **Yu Ma\***  
Reject & Resubmit in *Operations Research*
- [4] Personalized Breast Cancer Screening ([link](#))  
Dimitris Bertsimas, **Yu Ma\***, Omid Nohadani  
*JCO Clinical Cancer Informatics* (IF: 3.3), 2023
- [5] Towards Stable Machine Learning Model Retraining via Slowly Varying Sequences ([link](#))  
(alphabetical) Dimitris Bertsimas, Vassilis Digalakis Jr\*, **Yu Ma\***, Phevos Paschalidis\*  
In preparation for *Journal of Machine Learning Research*

### *Analytics-Driven Clinical Policy Making:*

- [6] Early Warning Alert Index for Patient Deteriorations in Hospitals  
Dimitris Bertsimas, **Yu Ma\***, et al.  
To be submitted to *Healthcare Management Science*, currently under FDA approval
  - ★ Implemented at Hartford Hospital, the largest hospital system in Connecticut

- [7] Towards Optimal Valve Prescription for Transcatheter Aortic Valve Replacement (TAVR) Surgery: An Optimal Policy Tree Approach  
Phevos Paschalidis†, Vasiliki Stoumpou, Lisa Everest, **Yu Ma**, et al.  
Submitted to *Healthcare Management Science*
- [8] Using interpretable Artificial Intelligence to optimize the use of imatinib following resection of localized GIST: an observational cohort study ([link](#))  
Dimitris Bertsimas, Georgios Antonios Margonis, Suleeporn Sujichantararat, Angelos Koulouras, **Yu Ma**, et al.  
*Lancet Oncology* (IF: 42.2), 2024
- [9] Automated Segmentation of Sarcoma and Its Surrounding Muscles Using Deep Learning Ensemble ([link](#))  
(alphabetical) Leonard Boussioux\*, **Yu Ma\***, et al.  
*International Journal of Radiation Oncology, Biology, Physics* (IF:6.1), 2023
- [10] Using Artificial Intelligence to Find the Optimal Margin Width in Hepatectomy for Colorectal Cancer Liver Metastases ([link](#))  
Dimitris Bertsimas, Georgios Antonios Margonis, Suleeporn Sujichantararat, Thomas Boerner, **Yu Ma** et al.  
*JAMA Surgery* (IF: 15.7), 2022
- [11] Can Artificial Intelligence Improve the Appropriate Use and Decrease the Misuse of REBOA?([link](#))  
(alphabetical) Mary Bokenkamp\*, **Yu Ma\***, et al.  
Major Revision at *PLOS ONE* (IF: 2.9)
- [12] Toward an Optimized Staging System for Pancreatic Ductal Adenocarcinoma: A Clinically Interpretable, Artificial Intelligence Based Model ([link](#))  
Dimitris Bertsimas, Georgios Antonios Margonis, Yifei Huang, Nikolaos Andreatos, Holly Wiberg, **Yu Ma** et al.  
*JCO Clinical Cancer Informatics* (IF: 3.3), 2021
- [13] Using Interpretable Artificial Intelligence Algorithms in the Management of Blunt Splenic Trauma  
(alphabetical) Vahe S. Panossian\*, **Yu Ma\***, et al.  
Submitted to *Nature Medicine*
- [14] Prediction of Risk of Post-Endovenous Thermal Ablation Complications ([link](#))  
(alphabetical) Azadeh Tabari\*, **Yu Ma\***, et al.  
To be submitted to *Journal of Vascular Surgery: Venous and Lymphatic Disorders* (IF: 3.1)
- [15] Prediction of Domestic Violence Abused Patients: A Multimodal Machine Learning Approach  
Dimitris Bertsimas, Kimberly Villalobos Carballo, Jiayi Gu, **Yu Ma**, Bharti Khurana.  
Submitted to *Lancet Digital Health*.
- [16] TabText: a Systematic Approach to Aggregate Knowledge Across Tabular Data Structures ([link](#))  
Kimberly Villalobos Carballo, Liangyuan Na, **Yu Ma**, et al.  
Manuscript in preparation.

## AWARDS

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Recipient of Takeda Fellowship <i>This fellowship is awarded to 12-13 PhD students each year across the MIT School of Engineering in recognition of their outstanding academic record, exceptional background, and promising future.</i>	2024-2025
INFORMS DMDA Workshop Best Paper Finalist (Applied Track)	2024
Third Best Talk at CMU YinzOR Flash Talk Competition	2024
Recipient of Wellcome Trust Fellowship	2021-2023
1st Place & Presenter of Cognex Prize at MIT MIMO Symposium: <i>The award highlights unique and innovative applications of advanced data analytics, optimization, and AI to complex operational challenges, and was scored highest by the judging panel across all grading criteria.</i>	2022
1st Prize Operations Research Center's Common Experience Deep Learning Challenge	2021

TEACHING EXPERIENCE AND RESEARCH MENTORSHIP

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**Analytics for a Better World, MIT 15.076***Graduate (Executive MBA), 18 students**Teaching Assistant, Spring 2021***Analytics Edge, MIT 15.727***Graduate (Executive MBA), 70 students**Head Teaching Assistant, Spring 2023 & 2024, Teaching Assistant, Spring 2022***Analytics Tools, MIT 15.003***Graduate (Master of Business Analytics), 80 students**Instructor, Fall 2022 & 2024***Machine Learning under a Modern Optimization Lens, MIT 15.095***Graduate (Master of Business Analytics, PhD), 100-120 students**Guest Lecturer, Fall 2023 & 2024***MIT Student Mentees***Master: Tiana Cui, Jesus Palazuelos, Bolin Song, Peggy Wang, Yuepeng Wang, Sara Pasquino, Nidhish Nerur**Undergraduate: Anne Gvozdjak, Cher Jiang, Tyler Kim, Dimitris Kriezis, Phevos Paschalidis, Seehana Tang, Aaron Zhu*EXPERIENCES

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**eBay***Applied Researcher*

Summer 2023

*New York, NY*

- Large Language Model on personalized recall recommendation team at Merchandising & Ads.

**University of Chicago, IMSI***Long-term Resident*

Spring 2023

*Chicago, IN*

- Participant of Mathematics, Statistics, and Innovation in Medical and Health Care Workshop.

SERVICE AND OUTREACH

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**Reviewer:** Computational Management Science, INFORMS TutORials Session.**Session Chair:** INFORMS Annual Meeting 2024, INFORMS Healthcare Conference 2023.**Seminar Coordinator:** MIT Operations Research Center IAP Seminar Spring 2023, Student Seminar 2022.**Vice President:** MIT INFORMS Student Chapter 2021-2022.**Graduate Student Representative:** MIT Committee on the Use of Humans as Experimental Subjects 2021-2023.**Graduate Student Representative:** MIT External Affairs Board - Washington DC Advocacy 2022.**Problem Planning & Judge:** Analytics for a Better World Hackathon 2022.TALKS

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*M3H: Multimodal Multitask Machine Learning for Healthcare*

- *Upcoming:* MIT Operations Management Seminar 2024, Cambridge MA
- *Upcoming:* INFORMS Annual Meeting DMDA Workshop Best Paper Competition 2024, Seattle WA
- *Upcoming:* INFORMS Annual Meeting Data Science Workshop 2024, Seattle WA
- *Upcoming:* INFORMS Annual Meeting General Session 2024, Seattle WA
- Cornell ORIE Young Scholar Workshop 2024, Ithaca NY
- CMU YinzOR Selected Flash Talk 2024, Pittsburgh PA

*Integrated Multimodal Artificial Intelligence Framework for Healthcare Applications*

- MIT-MGB AI Cures 2022, Cambridge MA
- MIT ORC Student Seminar 2022, Cambridge MA

- MIT Machine Intelligence for Manufacturing and Operations (MIMO) 2022, Cambridge MA
- Keynote for Janssen Pharmaceuticals Conference 2022, Cambridge MA
- INFORMS Annual Meeting 2022, Indianapolis IN
- INFORMS Annual Meeting Poster Competition 2022, Indianapolis IN
- INFORMS Healthcare Conference 2023, Toronto Canada

*Personalized Breast Cancer Screening*

- INFORMS Healthcare Conference 2023, Toronto Canada
- INFORMS Annual Meeting 2023, Phoenix, AZ
- Manufacturing & Services Operation Management (MSOM) Conference 2024, Minneapolis MN

*TabText: a Systematic Approach to Aggregate Knowledge Across Tabular Data Structures*

- INFORMS Annual Meeting Workshop: the Future of Analytics and OR 2022, Cambridge MA

*Automated Segmentation of Sarcoma and Its Surrounding Muscles Using Deep Learning Ensemble*

- MIT-MGB AI Cures 2022, Cambridge MA

## SKILLS

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**Languages** | *Fluent:* English. *Native:* Mandarin.

**Programming** | *Proficient:* Python, Julia, R. *Prior experience:* SQL, Matlab.

**Software Tools** | PyTorch, TensorFlow, JuMP, Gurobi.

## REFERENCES

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**Prof. Dimitris Bertsimas**

Sloan School of Management  
Massachusetts Institute of Technology  
dbertsim@mit.edu

**Prof. Nikos Trichakis**

Sloan School of Management  
Massachusetts Institute of Technology  
nitric@mit.edu

**Prof. Jónas Oddur Jónasson**

Sloan School of Management  
Massachusetts Institute of Technology  
joj@mit.edu