

CONTACT INFORMATION	535F S.W. Mudd Building 500 West 120th St., New York, NY 10027	adam@ieor.columbia.edu www.columbia.edu/~ae2516/
EMPLOYMENT	Columbia University , New York, NY <i>Department of Industrial Engineering and Operations Research (IEOR)</i> <i>Data Science Institute (DSI)</i> Assistant Professor	August 2015 - present
	IBM T.J. Watson Research Center , Yorktown Heights, NY <i>Department of Business Analytics and Mathematical Sciences</i> Postdoctoral Researcher in Smarter Commerce	August 2014 - July 2015
EDUCATION	Massachusetts Institute of Technology , Cambridge, MA <i>Operations Research Center</i> Ph.D. in Operations Research	September 2009 - June 2014
	<ul style="list-style-type: none">• Advisor: Retsef Levi• Track: Operations Management• Thesis: <i>New Approaches for Integrating Revenue and Supply Chain Management</i>	
	Cornell University , Ithaca, NY <i>School of Operations Research and Information Engineering</i> B.S. in Operations Research and Engineering	August 2006 - May 2009
	<ul style="list-style-type: none">• Minor in Applied Mathematics	
FIELDS OF SPECIALIZATION	Prescriptive Analytics, Revenue Management & Pricing, Machine Learning, Supply Chain & Logistics	
STUDENT SUPERVISION	<i>Ph.D. Students:</i> Yunfan Zhao Harsh Sheth (co-advised with Vineet Goyal) Xiao Lei Yeqing Zhou Ryan McNellis (2019) Thesis: <i>Training Decision Trees for Optimal Decision-Making</i> First position: Applied Research Scientist at Amazon Yunjie Sun (2019) Thesis: <i>Pricing Analytics for Reusable Resources</i> First position: Senior Data Scientist at TripAdvisor Michael Hamilton (2019) Thesis: <i>Pricing Tools and Analysis for Emerging e-Commerce Technologies</i> First position: Assistant Professor at Katz Graduate School of Business, University of Pittsburgh <i>Ph.D. Thesis Committee Member:</i> Xinshang Wang (2017), Francois Fagan (2018), Shuangyu Wang (2018), Suraj Keshri (2019), Ashraf Chamseddine (2019, American University of Beirut), Zhe Liu (2019, Columbia Business School), Vladlena Powers (2020), Randy Jia (2020), Min-hwan Oh (2020), Shuoguang Yang (2020), Kumar Goutam (2020), Fengpei Li, Jingtong Zhao <i>M.S. Students:</i> Weixuan Tang (2020), Zining Fan (2020), Othman El Balghiti (2019), Alexandra Tardif (2018), Xiao Lei (2018 → Columbia Ph.D.), Cheng Guo (2017 → U. Toronto Ph.D.), Yeqing Zhou (2016 → Columbia Ph.D.)	

B.S. Students: Chiara Régniez (2020), Alysha Hudson (2020), Jinglei Zhang (2019), Jason Liang (2018 → MIT Ph.D.), Omar Abboud (2016 → Harvard M.S.)

PUBLICATIONS AND
ACCEPTED PAPERS

Notes: (i) Underlined authors are supervised students. (ii) The default author order is alphabetical.

1. N. Chen, A. N. Elmachtoub, M. L. Hamilton, and X. Lei. *Loot Box Pricing and Design*. **Management Science**, forthcoming.
 - Accepted to The 21st ACM Conference on Economics and Computation (**EC**), 2020.
 - Invited to present at the Federal Trade Commission (FTC) Workshop on Consumer Issues Related to Loot Boxes, 2019 (one of four research papers selected).
 - 1st place for Xiao Lei, IBM Best Student Paper Award in Service Science, 2019.
2. A. N. Elmachtoub and M. L. Hamilton. *The Power of Opaque Products in Pricing*. **Management Science**, forthcoming.
 - Accepted to The 13th Conference on Web and Internet Economics (**WINE**), 2017.
3. A. N. Elmachtoub, J. C. N. Liang, and R. McNellis. *Decision Trees for Decision-Making under the Predict-then-Optimize Framework*. Proceedings of the 37th International Conference on Machine Learning (**ICML**), 2020.
4. A. N. Elmachtoub, V. Gupta, and M. L. Hamilton. *The Value of Personalized Pricing*. **Management Science**, forthcoming.
 - Accepted to The 15th Conference on Web and Internet Economics (**WINE**), 2019.
 - Finalist, INFORMS Service Science Cluster Best Paper Award, 2018.
5. O. Besbes, A. N. Elmachtoub, and Y. Sun. *Static Pricing: Universal Guarantees for Reusable Resources*. **Operations Research**, forthcoming.
 - Accepted to The 20th ACM Conference on Economics and Computation (**EC**), 2019.
 - Spotlight presentation at INFORMS Revenue Management and Pricing (RMP), 2019 (top 20% of full paper submissions).
 - Finalist (part 1 of 2), INFORMS Revenue Management and Pricing (RMP) Practice Award, 2019.
6. O. Besbes, A. N. Elmachtoub, and Y. Sun. *Pricing Analytics for Rotable Spare Parts*. **INFORMS Journal on Applied Analytics**, Vol. 50(5), p. 313-324, 2020.
 - Finalist, Daniel H. Wagner Prize for Excellence in Operations Research Practice, 2019.
 - Finalist (part 2 of 2), INFORMS Revenue Management and Pricing (RMP) Practice Award, 2019.
7. O. El Balghiti, A. N. Elmachtoub, P. Grigas, and A. Tewari. *Generalization Bounds in the Predict-then-Optimize Framework*. Advances in Neural Information Processing Systems 32 (**NeurIPS**), p. 14389-14398, 2019.
8. A. N. Elmachtoub, R. McNellis, S. Oh, and M. Petrik. *A Practical Method for Solving Contextual Bandit Problems Using Decision Trees*. Proceedings of the Thirty-Third Conference on Uncertainty in Artificial Intelligence (**UAI**), 2017.
 - Invited for oral presentation (top 10% of submissions).
9. A. N. Elmachtoub and R. Levi. *Supply Chain Management with Online Customer Selection*. **Operations Research**, Vol. 64(2), p. 458-473, 2016.
10. M. Cheung, A. N. Elmachtoub, R. Levi, and D. B. Shmoys. *The Submodular Joint Replenishment Problem*. **Mathematical Programming**, Vol. 158(1), p. 207-233, 2016.

11. A. N. Elmachtoub and R. Levi. *From Cost Sharing Mechanisms to Online Selection Problems*. **Mathematics of Operations Research**, Vol. 40(3), p. 542-557, 2015.
12. D. Sheldon, B. Dilkina, A. N. Elmachtoub, R. Finseth, A. Sabharwal, J. Conrad, C. Gomes, D. Shmoys, W. Allen, O. Amundsen, and W. Vaughan. *Maximizing the Spread of Cascades Using Network Design*. Proceedings of the Twenty-Sixth Conference on Uncertainty in Artificial Intelligence (**UAI**), p. 517-526, 2010.
 - Invited for oral presentation (top 12% of submissions).
13. A. N. Elmachtoub and C.F. Van Loan. *From Random Polygon to Ellipse: An Eigenanalysis*. **SIAM Review**, Vol. 52(1), p. 151-170, 2010.
 - Charles F. Van Loan selected this work as the subject for his 2018 John von Neumann Lecture.

SUBMITTED PAPERS

1. A. N. Elmachtoub, D. D. Yao, and Y. Zhou. *The Value of Flexibility from Opaque Selling*. First version: November 2019. Major revision in **Management Science**.
2. M. C. Cohen, A. N. Elmachtoub, and X. Lei. *Price Discrimination with Fairness Constraints*. First version: September 2019. Current version: June 2020. Major revision in **Management Science**.
 - Accepted (oral presentation) to The 4th Workshop on Mechanism Design for Social Good (**MD4SG**), 2020.
3. A. Aouad, A. N. Elmachtoub, K. Ferreira, and R. McNellis. *Market Segmentation Trees*. First version: June 2019. Current version: January 2020. Major revision in **Manufacturing & Service Operations Management**.
4. A. N. Elmachtoub and P. Grigas. *Smart “Predict, then Optimize”*. First version: October 2017. Current version: July 2020. Minor revision in **Management Science**.
5. A. N. Elmachtoub, Y. Wei, and Y. Zhou. *Retailing with Opaque Products*. First version: September 2015. Current version: July 2020. Major revision in **Manufacturing & Service Operations Management**.

AWARDS

NSF CAREER Award, 2020
 1st place for advisee Xiao Lei, IBM Best Student Paper Award in Service Science, 2019
 Finalist, Daniel H. Wagner Prize for Excellence in Operations Research Practice, 2019
 Finalist, INFORMS Revenue Management and Pricing (RMP) Practice Award, 2019
 Finalist, INFORMS Service Science Cluster Best Paper Competition, 2018
 IBM Faculty Award, 2016
 Forbes 30 under 30 in science, 2016
 National Defense Science and Engineering Graduate (NDSEG) Fellow, AFOSR, 2009-2012
 MIT Charles M. Vest Presidential Fellow, 2009
 Degree Marshall for Cornell University, 2009 (Ranked 1st in School of Engineering)
 Byron W. Saunders Prize, 2009 (Best GPA in Cornell School of ORIE)
 Merrill Presidential Scholar, 2009 (Top 1% at Cornell University)

FUNDING

National Science Foundation, CMMI-1944428 - *CAREER: Enhancing E-commerce and Service Systems by Embracing Consumer Flexibility* (PI), 2020-2025 (\$594,418)
 Columbia University - Technology Innovations for Urban Living in the Face of COVID-19, *Designing Safe Elevator Systems amidst a Pandemic* (PI with Charles Branas and Cliff Stein), 2020-2021 (\$85,000)
 Dassault Falcon Jet - Industry Collaboration (PI), 2019 (\$132,500)
 National Science Foundation, CMMI-1763000 - *Collaborative Research: Operations-Driven Machine Learning* (PI), 2018-2021 (\$314,206)
 Dassault Falcon Jet - Industry Collaboration (PI), 2018 (\$142,500)
 Dassault Falcon Jet - Industry Collaboration (PI), 2017 (\$150,000)
 IBM Faculty Award - *Cognitive Analytics for Personalized Pricing and Offers*, 2016 (\$40,000)

Total funding so far is \$1,458,624.

TEACHING
EXPERIENCE

Columbia University

Instructor (Number of Students, Course Rating out of 5, Instructor Rating out of 5)

- EL 7011 Data Analytics for Law (Executive L.L.M.): Summer 2020, Summer 2021
- IEOR 4418 Transportation Analytics and Logistics (B.S./M.S elective): Fall 2016 (18, 4.83, 4.88), Spring 2018 (31, 4.94, 4.92), Spring 2019 (27, 4.64, 4.73), Spring 2020 (25, N/A due to covid-19), Spring 2021
- IEOR 4650 Business Analytics (B.S.): Spring 2017 (20, 4.92, 4.86), Spring 2018 (55, 4.64, 4.73), Spring 2020 (33, N/A due to COVID-19), Spring 2021
- IEOR 4650 Business Analytics (M.S.): Spring 2016 (62, 4.52, 4.48), Spring 2017 (72, 4.71, 4.85), Spring 2018 (47, 4.83, 4.92), Spring 2019 x2 (76/78, 4.17, 4.15), Fall 2020
- IEOR 8100 Supply Chain Management (Ph.D.): Spring 2016 (10, 4.92, 5.00)
- IEOR 8100 Contextual Optimization for Prescriptive Analytics (Ph.D.): Fall 2019 (9, 4.80, 5.00)

Massachusetts Institute of Technology

Teaching Assistant

- 15.734 Operations Management (Executive MBA): Spring 2013 (6.68/7)
- 15.060 Data, Models, and Decisions (MBA): Fall 2012 (4.47/5)

Cornell University

Teaching Assistant

- ORIE 3300/5300 Optimization I (B.S./ M. Eng.): Fall 2008 (4.57/5)
- ENGRG 2940 Academic Excellence Workshop for Linear Algebra (B.S.): Fall 2007

INDUSTRY
EXPERIENCE

NYC Mayor's Office (pandemic logistics, 2020-present), FreshDirect (online grocery, 2019-present), Graham Windham (foster care, 2018-present), MediaMath (online advertising, 2017-2019), Dassault Falcon (private jets, 2016-2019), IBM (analytics, 2014-2016), NBA (basketball, 2014), Tampa Bay Rays (baseball, 2012), Novartis (pharmaceuticals, 2012), ZS Associates (consulting, 2008)

PATENTS

A. N. Elmachtoub, M. R. Ettl, S. Oh, M. Petrik, and R. K. Ravi. Segmentation based estimation method for demand models under censored data. US Patent 2018/0060885.

A. N. Elmachtoub and R. Lederman. Revenue management using dynamic customer selection. US Patent 2017/0358001.

A. N. Elmachtoub, M. R. Ettl, S. Oh, M. Petrik, and R. K. Ravi. Training a machine to dynamically determine and communicate customized, product-dependent promotions with no or limited historical data over a network. US Patent 2017/0046732.

A. N. Elmachtoub, M. R. Ettl, S. Oh, M. Petrik, and R. K. Ravi. Determining feature importance and target population in the context of promotion recommendation. US Patent 10546320, 2020.

INVITED TALKS

*Notes: (i) A * symbol implies the talk was given by a coauthor in a peer-reviewed conference without proceedings. (ii) Talks for papers accepted at conferences listed above are not repeated here.*

Contextual Optimization: Bridging Machine Learning and Operations

- Massachusetts Institute of Technology, ORC Seminar, Virtual, October 2020
- Boğaziçi University, IE Seminar, Virtual, October 2020
- Duke University, Fuqua OM Seminar, Virtual September 2020
- Georgia Tech, ISyE Seminar, Virtual, September 2020
- Rutgers University, ISE Seminar, Piscataway, NJ, February 2020
- UC Berkeley, Berkeley-Columbia Meeting in Eng. and Statistics, Berkeley, CA, February 2020

Pricing Analytics for Reusable Resources

- Baruch College, Omega Seminar, Virtual, September 2020
- McGill University, Desautels OM Seminar, Montreal, CN, December 2019
- Columbia University, Business Analytics Initiative, New York, NY, November 2019
- INFORMS Annual Meeting, Seattle, WA, October 2019
- University of Rochester, Simon OM Seminar, Rochester, NY, May 2019

- University of Michigan, IOE Seminar, Ann Arbor, MI, March 2019

Selling Randomness

- American University of Beirut, IE Seminar, Virtual, September 2020

Smart “Predict, then Optimize”

- University of Toronto, MIE OR Seminar, Toronto, CN, December 2019
- Lehigh University, ISE Seminar, Bethlehem, PA, September 2019
- Machine Learning in Science and Engineering (MLSE) Conference, Atlanta, GA, June 2019
- UCLA, Anderson DOTM Seminar, Los Angeles, CA, November 2018
- Columbia University, IEOR Colloquium, New York, NY, November 2018
- Institute of Mathematics and Applications, U. of Minnesota, Minneapolis, MN, October 2018
- Uber, San Francisco, CA, August 2018
- EURO Conference, Barcelona, SP, July 2018
- Conference on Statistical Learning and Data Science, New York, NY, June 2018
- Massachusetts Institute of Technology, Sloan OM Seminar, Cambridge, MA, May 2018
- Yahoo Research, New York, NY, May 2018
- INFORMS Optimization Society Meeting, Denver, CO, May 2018
- INFORMS Annual Meeting, Houston, TX, October 2017
- ICCOPT, Tokyo, Japan, August 2016

Static Pricing: Universal Guarantees for Reusable Resources

- INFORMS Annual Meeting, Seattle, WA, October 2019

The Value of Consumer Flexibility in Scheduled Service Systems

- MSOM Conference, NUS, Singapore, July 2019*

Market Segmentation Trees

- Revenue Management & Pricing Conference, Stanford, CA, June 2019*

A Choice Modeling Framework for Service Time Windows

- MSOM Conference, NUS, Singapore, July 2019*
- Revenue Management & Pricing Conference, Stanford, CA, June 2019*

The Value of Flexibility from Opaque Selling

- MSOM Conference, Dallas, TX, July 2018*

The Value of Personalized Pricing

- MSOM Conference, Dallas, TX, July 2018*
- Revenue Management & Pricing Conference, Toronto, CN, June 2018

The Power of Opaque Products in Pricing

- MSOM Conference, Chapel Hill, NC, June 2017*
- Revenue Management & Pricing Conference, New York, NY, June 2016*
- POMS Annual Conference, Orlando, FL, May 2016

The Value of Opaque Products

- UC Berkeley, IEOR Seminar, Berkeley, CA, September 2017
- University of Southern California, Marshall DSO Seminar, Los Angeles, CA, September 2017
- Mostly OM, Tsinghua University, Beijing, China, May 2017
- Jet.com, Hoboken, NJ, March 2017
- New York University, Stern IOMS Seminar, New York, NY, October 2016

A Practical Method for Solving Contextual Bandit Problems Using Decision Trees

- Columbia University, Business Analytics Initiative, New York, NY, November 2016
- INFORMS Annual Meeting, Philadelphia, PA, November 2015
- Revenue Management & Pricing Conference, New York, NY, June 2015

Retailing with Opaque Products

- IBM T.J. Watson Research Center, AP For Lunch, Yorktown Heights, NY, July 2015
- MSOM Conference, Toronto, Canada, June 2015

- INFORMS Annual Meeting, San Francisco, CA, November 2014

Supply Chain Management and Logistics Models with Online Customer Selection

- Duke University, Fuqua DS Seminar, Durham, NC, March 2015

The Submodular Joint Replenishment Problem

- ISMP Conference, Pittsburgh, PA, June 2015
- IBM T.J. Watson Research Center, IP For Lunch, Yorktown Heights, NY, March 2015
- MSOM Conference, New York, NY, June 2012*

From Cost Sharing Mechanisms to Online Selection Problems

- MSOM Conference, New York, NY, June 2012
- INFORMS Annual Meeting, Phoenix, AZ, October 2012
- ISMP Conference, Berlin, Germany, August 2012

Supply Chain Management with Online Customer Selection

- INFORMS Annual Meeting, Charlotte, NC, November 2011
- MSOM Conference, Ann Arbor, MI, June 2011
- Harvard-MIT OM Student Seminar, Boston, MA October 2011
- Massachusetts Institute of Technology, Sloan OM Seminar, Cambridge, MA, February 2011
- INFORMS Annual Meeting, Austin, TX, November 2010

INVITED PANELS *Preparing a CAREER Proposal*, INFORMS New Faculty Colloquium, November 2020
Optimization, MIT ORC 65th Anniversary, November 2018
Engineering your Ph.D., Columbia University, August 2018

UNIVERSITY SERVICE Helped lead initiatives in modernizing course names (Spring 2016), business analytics programs (Fall 2016-Fall 2017), website (Fall 2018-Spring 2020)
 Co-organizer of 1st Year PhD Seminar (Fall 2016-Fall 2020)
 Co-organizer of The IEOR Colloquium (Fall 2018-present)
 Co-organizer of IEOR-DRO Seminar (Fall 2015-Fall 2017)
 Faculty advisor for Columbia INFORMS student chapter, (Spring 2016-present). *The chapter has earned the INFORMS Student Chapter Annual Award: Cum Laude in 2016 and 2017.*
 Faculty advisor for Columbia Mathematical Contest in Modeling (MCM) team (2017-2019). *Team received Finalist designation in 2017 and Meritorious Winner in 2018 and 2019.*
 Columbia IEOR Ph.D. Admissions Committee (2016-2018, 2020)
 Columbia IEOR M.S. Admissions Committee (2016-2020)
 Columbia IEOR Hiring Committee (2016-2017, 2017-2018, 2018-2019)
 Columbia DSI Hiring Committee (2015-2016)
 Columbia DSI M.S. Admissions Committee (2020)
 Columbia DSI Postdoctoral Fellows Hiring Committee (2020)
 Proposal Reviewer for Columbia SEAS Interdisciplinary Research Seed (SIRS) (2018)
 Founder of MIT Mathematical Contest in Modeling (MCM) Competition
 Founder of MIT ORC Resources for Easing Friction and Stress (REFS) Program
 MIT Teaching Certificate, 2012
 Co-organizer of Fall 2012 MIT Operations Research Seminar

ACADEMIC SERVICE Co-founder and co-organizer of NYC Operations Day (2018 at NYU, 2019 at Columbia, 2020 canceled last minute due to covid-19, 2021 at Cornell Tech)
 Associate Editor for *Service Science* (2019-present)
 Panelist, National Science Foundation (NSF), Operations Engineering (OE) program (2019)
 Co-chair of MSOM Supply Chain SIG Conference, Kelley School of Business, Indiana U, June 2021
 Co-chair of Industrial Engineering and Operations Research track, Machine Learning in Science and Engineering (MLSE) conference, Georgia Tech, June 2019
 Session Chair for INFORMS (2015-2020), EURO (2018)
 Member of INFORMS, MSOM, MOS, POMS
 Journal Reviewer for *Management Science* (Meritorious Service Award in 2017 and 2019), *Mathe-*

matics of Operations Research, Operations Research, Mathematical Programming, Manufacturing & Service Operations Management, Production and Operations Management, Naval Research Logistics, INFORMS Journal on Optimization, and European Journal of Operations Research

Program Committee member for *Economics and Computation (EC)* (2020)

Conference Reviewer for *MSOM Supply Chain SIG Conference* (2015), *MSOM Service Operations SIG Conference* (2018), *Conference on Uncertainty in Artificial Intelligence (UAI)* (2019), *International Conference in Machine Learning (ICML)* (2019), *Conference on Integer Programming and Combinatorial Optimization (IPCO)* (2020), and *International Conference on Artificial Intelligence and Statistics (AISTATS)* (2021)

Competition Reviewer for George Nicholson Student Paper Competition (2020-2021) and POM Supply Chain College Student Paper Competition (2016-2018, 2020)

MEDIA COVERAGE “*Columbia data scientist designs better e-commerce systems*” EurekaAlert!. July 20, 2020.

https://www.eurekaalert.org/pub_releases/2020-07/dsia-cds072020.php

“*Loot boxes are a matter of ‘life or death’ for problem gamblers, says researcher.*” PC Gamer. August 9, 2019. <https://www.pcgamer.com/loot-boxes-are-a-matter-of-life-or-death-for-problem-gamblers-says-researcher/>

“*Loot boxes a matter of “life or death,” says researcher.*” Games Industry. August 8, 2019. <https://www.gamesindustry.biz/articles/2019-08-08-loot-boxes-a-matter-of-life-or-death>

“*Your Holiday Impulses are the Stuff of On-Demand Logistical Nightmares.*” Wired. July 1, 2017. <https://www.wired.com/story/inside-the-black-magic-of-on-demand-holiday-delivery/>

“*10 Cornell alumni, 2 students make Forbes’ “30 Under 30” list.*” The Ithaca Voice. January 20, 2016. <https://ithacavoice.com/2016/01/9-cornell-alumni-2-students-make-forbes-30-under-30-list/>

“*Integrating Supply Costs and Sales to Maximize Profits.*” Columbia News. January 7, 2016. <https://ieor.columbia.edu/adam-elmachtoub-integrating-supply-costs-and-sales-maximize-profits>

“*25 from MIT named to Forbes 30 Under 30 lists in 2016.*” The MIT Tech. January 7, 2016. <http://news.mit.edu/2016/forbes-30-under-30-lists-0107>

“*IEOR researchers investigate how retailers can employ opaque products to reduce costs.*” Columbia Spectator. November 24, 2015. <https://www.columbiaspectator.com/news/2015/11/12/ieor-professor/>

SOFTWARE R, Python, Julia, Gurobi, MATLAB, CPLEX

PERSONAL **Citizenship:** USA and Lebanon

Languages: English, Arabic (fluent), Spanish (beginner)

Hobbies: Basketball, backgammon, soccer, stand-up comedy