# EL HOUSNI Omar

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**ACADEMIC APPOINTMENTS**

**Cornell University** and **Cornell Tech**, New York, NY

- Assistant Professor                                                                 Jan 2022-current
  School of Operations Research and Information Engineering
  Graduate Field Member in Operations Research and Applied Mathematics

- Visiting Assistant Professor                                                                 2020-2021

**EDUCATION**

**Columbia University**, New York, NY
- Ph.D. in Operations Research.                                                                 2016-2020
  Thesis: *Tractable Policies in Dynamic Robust Optimization*
  Advisor: Professor Vineet Goyal

- Master of Science in Operations Research                                                                 2015-2016

**Ecole Polytechnique**, Paris, France                                                                 2012-2015
  Bachelor of Science and Master of Science in Applied Mathematics

**SPONSORED RESEARCH**

"Pricing Commodities Based on Real-Time Flow of Supply and Demand", Mohammed VI Polytechnic University (Morocco). Role: Principal Investigator. $160,000, 2024-2025

"Collaborative Research: Coordinating Offline Resource Allocation Decisions and Real-Time Operational Policies in Online Retail with Performance Guarantees", National Science Foundation, CMMI-2226900. Role: Principal Investigator (co-PI Huseyin Topaloglu). $450,365, portion of Cornell University is $305,824, 2023-2026

"Urban Friendly e-Retail", Urban Tech Hub at Cornell Tech. Role: Principal Investigator (co-PI Huseyin Topaloglu). $99,880, 2022-2023

**AWARDS**

- Mathematical Programming 2023 Meritorious Service Award
- ORIE Graduate Outstanding Instructor Award 2023 (voted by Cornell ORIE graduate students)
- Cornell Tech Students Choice Award 2023 (voted by Cornell Tech graduating class M.Eng, MS, MBAs and LLMs students)
- Second prize in the INFORMS George Nicholson student paper competition, 2020
- Amazon Inventor Award, 2017
- The Graduate Fellowship for Masters in Operations Research, Columbia University, 2016
- Finalist in INFORMS Undergraduate OR student paper competition, 2015
- Ecole Polytechnique Research Prize in Applied Mathematics, 2015
- French Government's Major-Excellence Scholarship, 2012
- Honorable Mention in the 51st International Mathematical Olympiad, Astana, Kazakhstan, 2010

**JOURNAL PUBLICATIONS**

*LP-based Approximations for Disjoint Bilinear and Two-Stage Adjustable Robust Optimization* (joint with A. Foussoul and V. Goyal).
**Math Programming**, pages 1-43, 2023

*Fluid Approximations for Revenue Management under High-Variance Demand: Good and Bad Formulations* (joint with Y. Bai, B. Jin, P. Rusmevichientong, H. Topaloglu, D. Williamson)
**Management Science**, 69 (7), pages 4016-4026, 2023
Accepted to Fast Track in Management Science

*Joint Assortment Optimization and Customization under Mixture of Multinomial Logit Model: On the Value of Personalized Assortments* (joint with H. Topaloglu)
**Operations Research**, 71 (4), pages 1197-1215, 2023
Selected for presentation in the MSOM Supply Chain Management SIG, 2022

*On the Optimality of Affine Policies for Budgeted Uncertainty Sets* (joint with V. Goyal)
**Math of Operations Research**, 46 (2), pages 674-711, 2021
**2nd place in the INFORMS George Nicholson student paper competition, 2020**

*A Tractable Approach for Designing Piecewise Affine Policies in Dynamic Robust Optimization* (joint with A. Ben-Tal and V.Goyal).
**Math Programming**, 182 (1), pages 57-102, 2020

*Piecewise Static Policies for Two-stage Adjustable Robust Linear Optimization* (joint with V. Goyal)
**Math Programming** 169 (2), pages 649-665, 2018
**Finalist in INFORMS Undergraduate OR student paper competition, 2015**

REFEREED
CONFERENCE
PUBLICATIONS

*Adaptivity Gaps in Two-sided Assortment Optimization* (joint with A. Torrico and U. Hennebelle).
To appear in Proceedings of the International Conference on Integer Programming and Combinatorial Optimization (**IPCO**), 2024

*Assortment Optimization with Visibility Constraints* (joint with T. Barre and A. Lodi).
To appear in Proceedings of the International Conference on Integer Programming and Combinatorial Optimization (**IPCO**), 2024

*LP-based Approximations for Disjoint Bilinear and Two-Stage Adjustable Robust Optimization* (joint with A. Foussoul and V. Goyal). In Proceedings of the International Conference on Integer Programming and Combinatorial Optimization (**IPCO**), 223-236, 2022

*Matchings Riders to Drivers: A Two-stage Robust Optimization Approach* (joint with V. Goyal, O. Hanguir and C. Stein). In Proceedings of the International Conference on Approximation Algorithms for Combinatorial Optimization Problems (**APPROX**), 2021

*On the Power of Static Assignment Policies for Robust Facility Location Problems* (joint with V. Goyal and D. Shmoys). In Proceedings of the International Conference on Integer Programming and Combinatorial Optimization (**IPCO**), 252-267, 2021

*Beyond Worst-case: A Probabilistic Analysis of Affine Policies in Dynamic Optimization* (joint with V. Goyal). Advances of Neural Information Processing Systems (**NeurIPS**) **(spotlight talk)**, 2017

PAPERS UNDER
REVIEW

*Two-sided Assortment Optimization: Approximation Algorithms and Adaptivity Gaps in* (joint with A. Torrico and U. Hennebelle)
Major revision in **Operations Research**
Accepted for oral presentation at MATCH-UP 2024

*Assortment Optimization with Visibility Constraints* (joint with T. Barre, M. Ibn Brahim, A. Lodi, and D. Segev). Submitted to Mathematical Programming
Selected for presentation in the MSOM Supply Chain Management SIG, 2024

*Placement Optimization of Substitutable Products* (joint with R. Udwani)
Major revision in **Management Science**

*Maximum Load Assortment Optimization: Approximation Algorithms and Adaptivity Gaps* (joint with M. Ibn Brahim and D. Segev)
Minor revision in **Operations Research**

*Assortment and Price Optimization under an Endogenous Context-Dependent Multinomial Logit Model* (joint with Y. Bai, P. Rusmevichientong and H. Topaloglu)
Major revision in **Management Science**

*Coordinated Inventory Stocking and Assortment Optimization* (joint with Y. Bai, P. Rusmevichientong and H. Topalolgu)
Minor revision in **Operations Research**
Selected for presentation in the MSOM Supply Chain Management SIG, 2023

*Matchings Riders to Drivers: A Two-stage Robust Optimization Approach* (joint with V. Goyal, O. Hanguir and C. Stein)
Minor revision in **Operations Research**

*Joint Assortment and Inventory Planning under the Markov chain Choice Model* (joint with O. Mouchtaki, G.Gallego, V. Goyal, S. Humair, S. Kim, A. Sadighian, J. Wu)
Minor revision in **Management Science**

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| OTHER PAPERS | *Leveraging AI for Natural Disaster Management: Takeaways From The Moroccan Earthquake* (Morocco Solidarity Hackathon) **NeurIPS 6th Workshop** on Artificial Intelligence for Humanitarian Assistance and Disaster Response |

*Can Testing Ease Social Distancing Measures? Future Evolution of COVID-19 in NYC* (joint with Mika Sumida, Paat Rusmevichientong, Huseyin Topaloglu and Serhan Ziya) (*White paper)*

*Future Evolution of COVID-19 Pandemic in North Carolina: Can We Flatten the Curve?* (joint with Mika Sumida, Paat Rusmevichientong, Huseyin Topaloglu and Serhan Ziya) (*White paper)*

PATENTS

*Real-time Iterative Assortment Allocation Estimation* (joint with D.Bhatia, S.Humair, V.Jain, G.Li, J.Marasanapalle, A.Sadighian, and J.Wu) Amazon Research. Patent pending

INDUSTRY
EXPERIENCE

**Uber**, Data Scientist Intern, San Francisco, CA                                                Summer 2018
  Developed a machine learning and an optimization framework for Uber Eats targeted promotions.

**Amazon**, Research Scientist Intern, Seattle, WA                          Summer 2016, Summer 2017
  Developed a standardized decision-making process for Amazon fashion assortment planning (patent pending).

**EDF R&D,** Research Intern, Paris, France                                                        Fall 2014
  Developed a large scale optimization framework for scheduling employees rounds at the French flagship electric utility company EDF.

**Empresas Lipigas**, Supply Chain Analyst, Santiago, Chili                                   Summer 2014
  Implemented optimization algorithms for scheduling the production of gas cylinders under demand uncertainty.

TEACHING
EXPERIENCE

**Cornell Tech**, Instructor
  *ORIE 7391: Optimization for Revenue Management*, PhD (20 students)              Spring 2024
  *ORIE 5132: Pricing Analytics and Revenue Management*, graduate (40 students)    Spring 2023
  *ORIE 5530: Modeling under Uncertainty*, graduate (60 students)        Fall 2024,2023,2022,2021
  *ORIE 6360: Optimization under Uncertainty: Robust and Online Models*, (30 PhD) Spring 2022
  *ORIE 5250: Business Applications of Optimization*, graduate (20 students)        Summer 2021
  *ORIE 5132: Service Systems and Online Markets*, graduate (30 students)          Spring 2021

**Columbia University**, Teaching Assistant
  *IEOR 6613: Optimization*, PhD (30 students).                                      Fall 2016, 2018
  *IEOR 4601: Dynamic Pricing & Revenue Management*, graduate(50 students) Spring 2017,2020
  *IEOR 3404: Simulation*, undergraduate (90 students),                               Spring 2018
  *IEOR 3609: Advanced Optimization*, undergraduate (90 students)                     Spring 2019

**Columbia University Science Honors Program**, Co-instructor                          Spring 2019
  *Introduction to Algorithms*, (40 students).

**Mathematical Olympiad**, Instructor
  *Head coach and Instructor of the Moroccan International Mathematical Olympiad team, IMO 2019, Bath UK.*

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| PROFESSIONAL EXTERNAL SERVICE | -Problem Captain Pan-African Mathematics Olympiads (PAMO), Johannesburg, South Africa 2024 |

**PROFESSIONAL EXTERNAL SERVICE**
-Problem Captain Pan-African Mathematics Olympiads (PAMO), Johannesburg, South Africa 2024
-Organizing Committee for BIRS Workshop on Combinatorial Optimization for Online Platforms, Banff, Canada, April 2024
-Program Committee EC conference 2024
-Senior Coordinator at the International Mathematical Olympiad (IMO), Chiba Japan, 2023
-INFORMS Optimization Society Student Paper Prize committee 2023
-Organizing Committee of NYC Operations day, April 2022 (Cornell Tech) and May 2023 (Columbia)
-Organizing Committee Math&Maroc Competition, Benguerir Morocco, May 2023
-Session organizer for INFORMS Annual Meeting 2022, 2023, ICCOPT 2022, ISMP 2024
-Reviewer for *Operations Research, Management Science, Mathematical Programming, Mathematics of Operations Research, INFORMS journal on Computing, INFORMS journal on Optimization, MSOM journal, Naval Research Logistics, Optimization Letters, IPCO, ISCO, EC* and *MSOM-SIG.*
-Co-organizer of IEOR-DRO seminars at Columbia university, 2016-2020.

**CORNELL SERVICE**
-Cornell ORIE Search hiring committee member, 2024
-Cornell ORIE PhD Admissions committee member, 2023
-Cornell ORIE Director search committee member, 2023
-Cornell Tech Search committee member for communications and marketing, 2024
-Cornell Tech Research Collisions and Events committee member, 2022,2023
-Cornell Tech PhD life committee, ORIE representative, 2021,2023
-Cornell Tech Academic integrity committee member, 2022

**SKILLS**
**Arabic/French:** bilingual    **Spanish:** Fluent
**Programming:** Python, R, Matlab, CVX, GUROBI

**ADIVISING**
**Current Phd advisees:**
Marouan Ibn Brahim
Qing Feng (co-advisor: Huseyin Topaloglu)
Ulysse Hennebelle

**PhD Thesis committee member**
Weiyuan Li (Cornell ORIE)
Yuheng wang (Cornell ORIE)
Wenchang Zhu (Cornell ORIE)
Harsh Sheth (2023, Columbia IEOR)
Yuan Lorraine (Cornell Johnson)

**Former MEng students:**
Federico Tilberga (Cornell Tech Meng ORIE 2023) → PhD LBS
Yang Song (Cornell Tech Meng CS, 2022)

**Former Undergraduate interns:**
Matthieu Palançhon (Ecole Polytechnique, March-July 2024)
Auguste De Lambilly (Ecole Polytechnique, March-July 2024)
Theo Barre (Ecole Polytechnique March-July 2023) → MS UC Berkeley
Ulysse Hennebelle (Ecole Polytechnique March-July 2023) → PhD Cornell ORIE
Omar Bennouna (Ecole Polytechnique, March-July 2022) → PhD MIT EECS
Sean Michael Xiao Yang (Cornell CS, June-August 2022)
Marouane Ibn Brahim (Ecole Polytechnique March-July 2022) → PhD Cornell ORIE

**SELECTED TALKS**
Maximum Load Assortment Optimization
- INFORMS Optimization Society Conference, Houston, TX                    March 2024
- ISMP conference, Montreal, Canada                                       July 2024

Two-sided Assortment Optimization
- Carey Business School seminar, John Hopkins University, MD         September 2024

- IEOR seminar, UC Berkeley, CA — September 2024
- MATCH-UP conference, University of Oxford, UK — September 2024
- SWIMS workshop, Crete, Greece — July 2024
- IPCO conference, Wroclaw, Poland — July 2024
- MSOM conferenece, Minneapolis, MN — June 2024
- Aussois Workshop on Combinatorial Optimization, Aussois, France — January 2024

Placement Optimization of Substitutable Products
- INFORMS Annual meeting, Seattle, WA — October 2024
- RMP conference, Los Angeles, CA — July 2024

Matchings: From Graph Theory to Real-World Applications
- MMC competition, UM6P Benguerir, Morocco — July 2024

Matching Drivers to Riders: A Two-stage Robust Approach
- IRIS workshop, UM6P Benguerir, Morocco — December 2023

Coordinated Inventory Stocking and Assortment Personalization
- Amazon MOP seminar, Bellevue, WA — April 2024
- Mathematics and Decisions conference, UM6P Benguerir, Morocco — December 2023
- INFORMS Annual Meeting, Phoenix, CO — October 2023
- POMS conference, Orlando, FL — May 2023
- Market Innovation Workshop (virtual) — May 2023
- MSOM SIG, Montreal, Canada — June 2023

Fluid Approximations for Revenue Management under High-Variance Demand
- MSOM conference, Montreal, Canada — June 2023

From Ideas to Algorithms
- Faculty of Sciences BenMsik, Casablanca, Morocco — April 2023
- Regis High School, New York, NY — June 2023

Joint Assortment Optimization and Customization: On the Value of Personalized Assortments
- INFORMS Annual Meeting, Indianapolis, IN — Oct 2022
- MSOM SIG, Munich, Germany — June 2022
- RMP (virtual) — June 2022
- INFORMS Annual Meeting, Anaheim, CA — Oct 2021
- Cornell Applied Math seminars, Ithaca, NY — Sep 2021
- MSOM, (virtual) — June 2021
- RMP, (virtual) — June 2021

On the Power of Static Assignment Policies for Robust Facility Location Problems
- Robust Optimization Webinar, (virtual) — June 2023
- SIOPT, Seattle, WA — May 2023
- ICCOPT, Bethlehem, PA — July 2022
- INFORMS Optimization society Conference, Greenville, NC — March 2022
- IPCO, (virtual) — May 2021
- INFORMS Annual Meeting, Seattle, WA — Oct 2019

From Affine to Threshold Policies: a New Framework in Dynamic Robust Optimization
- Cornell ORIE, Ithaca, NY — Dec 2019
- Cornell Tech, New York, NY — Dec 2019

- Chicago Booth, IL                                                                      Jan 2020
- Imperial College Business School, London, UK                                           Feb 2020
- University of Waterloo, Combinatorics & Optimization, Canada                            Feb 2020
- Lyft Labs, New York, NY                                                                 Mar 2020

On the Power of Affine Policies for Capacity Planning under Demand Uncertainty
- MSOM, Singapore                                                                         Jul 2019

On the Optimality of Affine Policies for Budget of Uncertainty Sets
- INFORMS Annual Meeting, (virtual)                                                       Nov 2020
- ICCOPT, Berlin, Germany                                                                 Aug 2019
- ICSP, Trondheim, Norway                                                                 Jul 2019
- BIRS workshop, Banff, Canada                                                            Jan 2019
- INFORMS Annual Meeting, Phoenix, AZ                                                     Nov 2018
- INFORMS Optimization society Conference, Denver, CO                                     Mar 2018
- INFORMS Annual Meeting, Houston, TX                                                     Oct 2017

On the Power of Affine Policies in Two-Stage Adjustable Robust Optimization
- INFORMS Annual Meeting, Seattle, WA                                                     Oct 2019
- Imperial College, London, UK                                                            May 2017

Beyond Worst-case: A Probabilistic Analysis of Affine Policies in Dynamic Optimization
- Uber Tech Talks, San Francisco, CA                                                      Aug 2018
- ISMP, Bordeaux, France                                                                  Jul 2018
- TADC, London Business School, London, UK                                               May 2018
- INFORMS Optimization society Conference, Denver, CO                                     Mar 2018
- NIPS, Long Beach, CA                                                                    Dec 2017
- INFORMS Annual Meeting, Houston, TX                                                     Oct 2017
- Student seminar Columbia University, NY                                                 Oct 2017

Dynamic Resource Provisioning in Data Centers under Demand Uncertainty
- MSOM, Chapel Hill, NC                                                                   Jun 2017

Piecewise Affine policies for Dynamic Robust Optimization
- Young Researchers Workshop at Cornell ORIE, Ithaca, NY                                  Oct 2017
- Computational Management Science conference, Bergamo, Italy                             May 2017
- IBM Thomas J.Watson Research center, NY                                                 Dec 2016
- INFORMS Annual Meeting, Nashville, TN                                                   Nov 2016
- EURO of Operations Research, Poznan, Poland                                             Jul 2016
- Amazon seminars, Seattle, WA                                                            Jun 2016
- Student seminar Columbia University, NY                                                 Apr 2016

Affine policies for Multi-stage Dynamic Robust Optimization
- INFORMS Annual Meeting, Nashville, TN                                                   Nov 2016
- Student seminar Columbia University, NY                                                 Nov 2016

Piecewise Static policies for Two-stage Adjustable Robust Optimization
- Optimization days, Montreal, Canada                                                     May 2016
- INFORMS Annual Meeting, Philadelphia, PA                                                Nov 2015

Tractable Policies in Dynamic Robust Optimization
- Africa Business School- OCP Headquarters, Casablanca, Morocco                           Jun 2017