Min-hwan Oh

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Contact Information

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Education

Columbia University, New York, NY, USA

Ph.D., Operations Research **2015–Present**

Specialization in Data Science

Advisor: Garud Iyengar / Co-advisor: Assaf Zeevi

Columbia University, New York, NY, USA

B.A., Mathematics–Statistics **2015**

Summa cum laude

Departmental Honors in Statistics

Phi Beta Kappa

Research Interests

Sequential decision making under uncertainty, Reinforcement learning, Contextual bandits, Interpretable machine learning

Submitted Papers

13. **Sparsity-Agnostic Lasso Bandit**.
M. Oh, G. Iyengar, and A. Zeevi
Submitted.

12. **Multinomial Logit Contextual Bandits: Provable Optimality and Practicality**.
M. Oh and G. Iyengar
Preliminary version appeared at *Reinforcement Learning for Real Life Workshop, International Conference on Machine Learning (ICML), 2019.*
Submitted.

11. **Counting and Segmenting Sorghum Heads**.
M. Oh, P. Olsen, and K.N. Ramamurthy
Submitted.

Refereed Publications

10. **Crowd Counting with Decomposed Uncertainty**.
M. Oh, P. Olsen, and K.N. Ramamurthy
*Proceedings of the 34th AAAI Conference on Artificial Intelligence (**AAAI**), to appear, 2020.*

9. **Thompson Sampling for Multinomial Logit Contextual Bandits**.
M. Oh and G. Iyengar
*Advances in Neural Information Processing Systems (**NeurIPS**), 3145–3155, 2019.*

8. **Sequential Anomaly Detection using Inverse Reinforcement Learning**.
M. Oh and G. Iyengar
*Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining (**KDD**). 1480–1490, 2019.*
• Oral presentation in research paper track (top 9% of total submissions)

7. **Automatic event detection in basketball using Hidden Markov Models with energy based defensive assignment**.
S. Keshri, M. Oh, S. Zhang, and G. Iyengar
Journal of Quantitative Analysis in Sports 15(2), 141-153, 2019.

6. **Adaptive Pattern Matching with Reinforcement Learning for Dynamic Graphs**.
H. Kanezashi, T. Suzumura, D. Garcia-Gasulla, M. Oh, and S. Matsuoka
*IEEE International Conference on High Performance Computing, Data, and Analytics (**HiPC**), 92–101, 2018.*
• Best Paper Award winner

5. **Learning Graph Topological Features via GAN**.
W. Liu, H. Cooper, M. Oh, P.Y. Chen, S. Yeung, F. Yu, T. Suzumura, G. Hu
IEEE Access, 7, 21834–21843, 133600, 2019.
Preliminary version appeared at *Workshop on Implicit Generative Models, International Conference on Machine Learning (ICML), 2017.*

4. **Efficient "Shotgun" Inference of Neural Connectivity from Highly Sub-sampled Activity Data**.
D. Soudry, S. Keshri, P. Stinson, M. Oh, G. Iyengar, and L. Paninski
PLoS Computational Biology, 11 (10), e1004464, 2015.

3. **Graphical Model for Basketball Match Simulation**.
M. Oh, S. Keshri, and G. Iyengar
MIT Sloan Sports Analytics Conference, 2015.
• Finalist in Research Paper Competition (top 2% of total submissions)

Working Papers

2. **Unsupervised segmentation of neuroanatomy from multispectral images**.
U. Sümbül, M. Oh, J. Wohlwend, D. Roossien Jr., F. Chen, N, Barry, A. Marblestone, J. Cunningham, D. Cai, E. Boyden, and L. Paninski.

1. **Directed Exploration in PAC Model-free Reinforcement Learning**.
M. Oh and G. Iyengar.
Preliminary version appeared at *Exploration in Reinforcement Learning Workshop, International Conference on Machine Learning (ICML), 2018.*
• 2nd place winner, 2018 INFORMS Annual Meeting Poster Competition

Teaching Experience

Instructor, Columbia University

Graph Theory by Example, Science Honors Program	**Spring 2020**

Guest Lecturer, Columbia University

IEOR 4650 — Business Analytics	**Spring 2020**
IEOR 4106 — Stochastic Models	**Spring 2016**
SPRT 5350 — Fundamentals of Sports Analytics	**Spring 2016**

Teaching Assistant, Columbia University
Department of Industrial Engineering and Operations Research

IEOR 4720 — Deep Learning	**Fall 2018**
IEOR 4650 — Business Analytics	**Spring 2017, Spring 2018**
IEOR 4007 — Optimization Methods for FE	**Fall 2017**
IEOR 4404 — Simulation	**Fall 2016**
IEOR 3106/4106 — Stochastic Models	**Fall 2015, Spring 2016**

Teaching Assistant (as undergraduate), Columbia University
Department of Mathematics

MATH 4106 — Modern Analysis I **Fall 2014**
MATH 2010 — Linear Algebra **Spring 2014**
MATH 1202 — Calculus IV **Fall 2013**
MATH 1201 — Calculus III **Spring 2013**

Teaching Assistant (as undergraduate), Columbia Business School

Doctoral Machine Learning Workshop **Summer 2014**

Industry Experience

IBM T. J. Watson Research Center, Yorktown Heights, NY, USA

Computational and Statistical Learning Group at IBM Research AI
(Manager: Dr. Naoki Abe)

Summer Research Intern **May–August 2018**
Research topics include estimating object counts in images

Summer Research Intern **May–August 2017**
Research topics include real-time anomaly detection

Honors and Awards

NAVER Doctoral Fellowship, NAVER Corporation **2020**

CKGSB Doctoral Fellowship, Columbia University **2018–2020**

Outstanding Teaching Assistant Award, Columbia University **2020**

AAAI Student Scholarship, AAAI **2020**

NeurIPS Travel Award, Neural Information Processing Systems **2019**

KDD Student Travel Award, ACM SIGKDD **2019**

KSEA-KUSCO Scholarship, KSEA **2019**

W. Edwards Deming Doctoral Fellowship, Columbia University **2018**

Best Paper Award, IEEE International Conference on HiPC **2018**

2nd Place Winner, INFORMS Annual Meeting Poster Competition **2018**

Summa cum laude, Columbia University **2015**

Statistics Departmental Honors, Columbia University **2015**

Phi Beta Kappa Honor Society, Columbia University **2015**

Travel Grant, Statistical & Applied Mathematical Sciences Institute **2014**

John Northcott Scholarship, Columbia University **2012–2015**

Dean's List, Columbia University **2011–2015**

Dean's Scholarship, Columbia University **2011**

Invited Talks & Conference Presentation

"Thompson Sampling for Multinomial Logit Contextual Bandits"

INFORMS 2020 (upcoming)	November 2020
IFORS 2020 (postponed)	June 2020
NeurIPS 2019, Vancouver	December 2019
IBM Thomas J. Watson Research Center	November 2019
INFORMS Annual Meeting, Seattle	October 2019
INFORMS Workshop on Data Mining & Decision Analytics	October 2019

"Crowd Counting with Decomposed Uncertainty"

INFORMS 2020 (upcoming)	November 2020
AAAI 2020, New York	February 2020
Deming Doctoral Fellowship Seminar, Columbia University	April 2019

"Multinomial Logit Contextual Bandits"

INFORMS Annual Meeting, Seattle	October 2019
MSOM Conference, Singapore	July 2019
ICML 2019, Long Beach	June 2019
RM&P Conference, Stanford University	June 2019
POMS Annual Conference, Washington D.C.	May 2019
Data Science Day, Columbia University	April 2019

"Sequential Anomaly Detection using Inverse Reinforcement Learning"

INFORMS Workshop on Data Science	October 2019
KDD 2019, Anchorage	August 2019

"Automatic Event Detection in Basketball using HMM with Energy based Defensive Assignment"

INFORMS Annual Meeting, Seattle	October 2019
POMS Annual Conference, Washington D.C.	May 2019
Data Science Society Seminar, Columbia University	April 2018
NESSIS, Harvard University	September 2017
IBM Thomas J. Watson Research Center	June 2017

"Directed Exploration in PAC Model-Free Reinforcement Learning"

INFORMS Annual Meeting, Phoenix	November 2018
Princeton Day of Optimization, Princeton University	September 2018
IBM Thomas J. Watson Research Center	August 2018
ICML 2018, Stockholm	July 2018

"Graphical Model for Basketball Match Simulation"

Data Science Day, Columbia University	April 2016
Sports Analytics Seminar, Columbia University	March 2016
Columbia EPIC Graduate Student Research Seminar	February 2016
MIT Sloan Sports Analytics Conference, Boston	February 2015

Academic & Professional Services

Program Committee — KDD 2020

Conference Reviewer — NeurIPS 2020

Journal Reviewer — Management Science, JQAS

Session Chair — INFORMS Annual Meeting 2019; INFORMS Workshop on Data Mining & Decision Analytics 2019

Computer Skills

Languages — Python, R, Matlab, Scala, C++, Java, HTML/CSS.

Deep learning tools — Tensorflow, PyTorch, Theano, Keras.

Cloud computing — Apache Spark, Hadoop.