Juyoung **Wang**

Master of Applied Science in Industrial and Systems Engineering · Mathematical and Computational Engineer

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Education

University of Toronto (UofT) — *Toronto, Ontario, Canada*

Doctor of Philosophy student in Industrial and Systems Engineering — *Sep. 2021 - Ongoing*

- **Overall GPA**: 3.9/4.0
- **Advisors**: *Merve Bodur*.
- **Research topic**: Data-driven stochastic optimization.

University of Toronto (UofT) — *Toronto, Ontario, Canada*

Master of Applied Science in Industrial and Systems Engineering — *Jan. 2019 - Aug. 2021*

- **Overall GPA**: 3.8/4.0
- **Advisors**: *Merve Bodur (from University of Toronto)* and *Mucahit Cevik (from Ryerson University)*.
- **Research topic**: Mathematical optimization, Stochastic programming, Healthcare, Transportation and Logistics, Statistics, Machine learning.
- **Thesis title**: Multistage Stochastic Programming Combined with Deep Learning-based Time series Forecasting: New Methodologies and Applications

Pontifical Catholic University of Chile (PUC-Chile) — *San Joaquin, Santiago, Chile*

Bachelor of Engineering Sciences in Mathematical and Computational Engineering — *Mar. 2014 - Dec. 2017*

- **Overall GPA**: 5.6/7.0 (3.7/4.0 in American grading scheme)
- **Major GPA (for the last two years)**: 5.8/7.0 (3.8/4.0 in American grading scheme)
- Graduated with distinction (highest honors for students with Bachelor's degree)

Work experiences

Scotiabank — *Santiago, Chile*

Data scientist — *Jul. 2018 - Nov. 2018*

- Worked as a data scientist at Scotiabank. Hired directly by clients, after working three months as an external consultant.

SII Group — *Santiago, Chile*

Consultant — *Apr. 2018 - Jul. 2018*

- Worked as a data science consultant at SII Group, together with digital banking team of Scotiabank.

Skills

Programming Python, Julia, MATLAB, SQL, R, C++

Packages Tensorflow, Keras, Pytorch, Gurobi, CPLEX, Scikit-learn, JuMP, SDDP.jl, MSPPy, among others

Languages Korean (Mother tongue), Spanish (Native), English (Advanced, TOEFL iBT 110/120 at 2018)

Publications and Preprints

- Chi, C., Mohamed Aboussalah, A., Boutros Khalil, E., Wang, J. & Sherkat-Masoumi, Z. (2022). A Deep Reinforcement Learning Framework for Column Generation. Submitted.
- Ozyegen, O., Wang, J. & Cevik, M. (2022). DANLIP: Deep Autoregressive Networks for Locally Interpretable Probabilistic Forecasting. Submitted.
- Bodur, M., Cevik, M., Cire, A., Ruschin, M. & Wang, J. (alphabetical ordering by surnames) (2022). Multistage Stochastic Fractionated Intensity Modulated Radiation Therapy Planning. Major revision in Computers and Operations Research.
- Wang, J., Cevik, M., & Bodur, M. (2021). On the impact of deep learning-based time-series forecasts on multistage stochastic programming policies. INFOR: Information Systems and Operational Research, 1-32.
- Wang, J., Cevik, M., Amin, S. H., & Parsaee, A. A. (2021). Mixed-integer linear programming models for the paint waste management problem. Transportation Research Part E: Logistics and Transportation Review, 151, 102343.

Honors and awards

2021-2022 **MIE Doctoral graduate research fellowship**, Awarded by UofT MIE department (CAD 20,000 per year) — *Toronto, Canada*

2019-2021 **MIE Masters graduate research fellowship**, Awarded by UofT MIE department (CAD 16,000 per year) — *Toronto, Canada*

2017 **Graduated with distinction**, Highest honor available for Engineering bachelor's students at PUC-Chile. — *Santiago, Chile*

Academic experiences

Industry-University cooperation projects at University of Toronto
Oct. 2019 - Oct. 2020

- Together with the LG Science Park and research team at Data Science Laboratory of Ryerson University, we worked on neural-network based time-series prediction algorithms, having Merve Bodur and Mucahit Cevik as the principal investigators.

Industry-University cooperation projects at Pontificia Universidad Católica de Chile
Aug. 2017 - Dec. 2017

- As a part of a graduation project, together with Vicente Gomez, and José Macherone, we worked with a data-driven consulting company Everis. We mainly worked on developing prediction models for scheduled appointment cancellations, in order to help people to build better schedules.

Teaching assistant positions at University of Toronto
Jan. 2019 - Aug. 2021

- Integer programming applications: Graduate level integer programming course. (2021 Winter)
- Algorithms & numerical methods: Undergraduate level algorithms course. (2020 Winter)

Teaching assistant positions held at Pontificia Universidad Católica de Chile
Mar. 2014 - Dec. 2017

- Optimization methods: Undergraduate level continuous optimization and operations research course (2017 Semester I)
- Calculus for economists: Undergraduate level course (2017 Semester I)
- Single variable calculus: Undergraduate level course (2016 Semester I)

Undergraduate research activities participated at Pontificia Universidad Católica de Chile
Jan. 2016 - Dec. 2017

- High-dimensional optimization in non-Euclidean geometry: Studied basics of high-dimensional statistics and optimization algorithms used in such a context, e.g. mirror-descent from a functional analytic viewpoint. The activity was advised by professor Cristobal Guzman. (2017)
- Large-scale continuous optimization: Studied basics of statistical learning and related optimization problems, e.g. best subset selection via modern optimization lens. This research activity was advised by professor Jorge Vera. (2016)

Talks

2021 CORS annual meeting
Online

Presenter — *Jun. 2021*

- Gave a talk on Multi-stage stochastic programming approach to Intensity Modulated Radiation Therapy planning problem.

2020 INFORMS annual meeting
Online

Presenter — *Nov. 2020*

- Gave a talk on Multi-stage stochastic programming approach to Intensity Modulated Radiation Therapy planning problem.

Optimization days 2019 at HEC Montréal
Quebec, Canada

Presenter — *May. 2019*

- Gave a talk with topic of mixed-integer linear programming models for the management of household hazardous wastes with an application to paint waste stream in Toronto.

Relevant courses

Coursera
Online

Massive open online courses

- **Deep learning specialization**: Networks and Deep Learning, Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization, Structuring Machine Learning Projects, Convolutional Neural Networks, Sequence Models
- **Generative adversarial networks specialization**: Build Basic Generative Adversarial Networks, Build Better Generative Adversarial Networks (Ongoing)
- **Probabilistic graphical models specialization**: Representation (Ongoing)
- **Reinforcement learning specialization**: Fundamentals of Reinforcement learning.

University of Toronto
Toronto, Canada

Graduate level courses — *Jan. 2019 - Apr. 2022*

- Constraint programming (B+), Data-driven optimization (A+), Duality theory in mathematical optimization (A-), Integer programming (A+), Markov Decision Processes (A+), Machine learning for mathematical optimization (A), Monte Carlo methods (A), Readings on new trends of stochastic optimization (PASS), and Stochastic programming and robust optimization (A+)

Pontificia Universidad Católica de Chile
Santiago, Chile

Graduate and undergraduate level courses — *Mar. 2014 - Dec. 2017*

- **Graduate level courses**: Convex optimization (Top graded), Advanced topics in machine intelligence (A+) and Mathematical foundations of data science (A+)
- **Undergraduate level courses**: Introduction to computer programming, Calculus I, Calculus II, Calculus III, Linear Algebra, Differential equations, Probability and statistics, Statistical inference, Regression analysis, Discrete mathematics, Real analysis, Measure theory, Functional analysis, Numerical analysis, Parallel algorithms for scientific computing, Operations research, Stochastic processes, Optimization methods, and Graduation project