Francisco J **Castillo-Zunino**

Industrial Engineer — MS in Operations Research & Industrial Engineering
GaTech PhD Student in Operations Research

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Education

Georgia Institute of Technology
Atlanta, GA, United States

PhD Operations Research Student — *Jan. 2018 — Expected Dec. 2021*

- Advisor: Prof. Pinar Keskinocak, PhD [William W. George Chair; Director of the Center for Health and Humanitarian Systems; INFORMS President-Elect 2020].
- Researching a patient scheduling optimization problem, by using approximation algorithms and heuristics to minimize over-time scheduling.
- Researching relevant factors that affect vaccination coverage rates in low-income countries. Working in collaboration with Emory University; funded by Bill & Melinda Gates Foundation. The Vaccine Exemplars project aims to generate actionable recommendations to the foundation, its partners, and to the global health community at large.
- Taught a 3-week course in the Summer Engineering Institute 2018 which focuses on underrepresented minorities rising 11th and 12th graders from across the United States. Students learned how to build and use simulation models to improve humanitarian systems.

Georgia Institute of Technology
Atlanta, GA, United States

MS Operations Research | GPA: 3.9/4.0 — *Aug. 2016 — Dec. 2017*

- Summer exchange program in Management Mathematics at University of Bergamo, Italy.

Pontificia Universidad Católica de Chile [Top 1 University in Latin America according to QS ranking 2018]
Santiago, Chile

MS Industrial Engineering — *Mar. 2013 — Dec. 2014*

- Advisor: Prof. Pedro Gazmuri, PhD.
- Thesis: Solved a complex batch scheduling problem through the application of genetic algorithms. The objective was to minimize the total makespan by determining the amount/size of produced batches, their production sequence, and machinery assignments.

Pontificia Universidad Católica de Chile
Santiago, Chile

BS Industrial Engineering | Diploma in Information Technology — *Mar. 2007 — Dec. 2012*

- Top 5% of the class (21 of 474).
- The IT Diploma consists in two years coursework related to topics such as software engineering, machine learning, business intelligence, etc.

Experience

Emory Healthcare
Atlanta, GA, United States

Graduate Research Assistant in Department of Emergency Medicine — *Aug. 2017 — Apr. 2018*

- Developed a simulation model of the Emory University Hospital's Emergency Department by using Arena Simulation software and R. The model's goal was to find bottlenecks in the system and to test the impact of different nurses and doctors schedules.

DICTUC [B Corp. owned by P. Univ. Católica de Chile — Applies technologies from School of Engineering to real-world problems]
Santiago, Chile

Industrial Engineer Researcher — *Jan. 2014 — Jul. 2016*

Consultant in applied simulation and optimization.
Projects developed per client:

- **SQM** [Mining Company; US$442M Net Income 2018]: Lead a team of Software Engineers to develop an online software, used to optimize the long-term production scheduling to maximize profits. Testing new scenarios used to take weeks while it takes a couple of minutes with the software. The software was developed with Django-Python-Gurobi and mounted in an AWS server.
- **FCAB** [Train Company; US$173M Revenue 2018]: Operational analysis and simulation model for optimizing the railroad schedules to reduce delays. The simulation model was developed with Simio Simulation software.
- **Movistar** [Telecommunications Company; €3.9B Net Income 2018]: Simulation of queuing systems to minimize waiting times by changing employee's schedules. Used Simio Simulation software and Python.
- **Santa María Clinic**: Simulation of the flow of people inside the clinic to reduce the congestion. Used Simio Simulation software.
- **Copec** [Gas Stations Chain; US$1.1B Net Income 2018]: Simulation of gas stations for personnel scheduling. Used Simio Simulation software.

Pontificia Universidad Católica de Chile
Santiago, Chile

Teaching Assistant — *Aug. 2010 — Jul. 2016*

TA in the following courses:

- **Thesis Workshop** (8 semesters): Course of the Master in Industrial Engineering that helps students through the development of their thesis.
- **Organizational Behavior** (6 semesters): Taught by Emeritus Professor Nicolás Majluf, PhD.
- **Simulation** (3 semesters): Taught by Professor Pedro Gazmuri, PhD.
- **Videogame Development** (3 semesters): Taught by Professor Alejandro Woywood.
- **Introduction to Programming** (1 semester)

Sodimac [Home Improvement Store Chain; US$1,119M Net Income 2018] *Santiago, Chile*

Logistics Intern *Jan. 2011*

- Developed an activity-based costing analysis for all activities carried out in its main distribution center.

Publications

Castillo, F., & Gazmuri, P. (2015). Genetic algorithms for batch sizing and production scheduling. *Springer, London*

The International Journal of Advanced Manufacturing Technology, 77(1–4), 261–280. *Mar. 2015*

Castillo-Zunino, F. (2014). "Algoritmos genéticos para planificar la secuencia, asignación, tamaño y cantidad de lotes en una planta multi-producto" *Santiago, Chile*

Online Repository of Pontificia Universidad Católica de Chile *Jul. 2014*

- MS in Industrial Engineering thesis.

Skills

Programming **Advanced Skills:** C#, R, Python, Gurobi, LaTeX **Intermediate Skills:** Java, SQL, PHP, HTML, CSS, JavaScript

Software Microsoft Office, Excel VBA, Simio & Arena Simulation, Weka

Languages Spanish, English, Japanese (elementary proficiency)

Honors & Awards

2019 **Poster Finalist**, in Mixed Integer Programming Workshop 2019; hosted by Massachusetts Institute of Technology.

2018 **Doctorate "Becas Chile" Scholarship**, given by the Chilean government for studying a PhD abroad.

2016 **Fulbright Grantee**, for studying a Masters program in the United States.

2016 **Master "Becas Chile" Scholarship**, given by the Chilean government for studying a MS abroad.

2014 **Maximum Distinction**, when graduating from the MS in Industrial Engineering, P. Universidad Católica de Chile.

2012 **Maximum Distinction**, when graduating from the BS in Industrial Engineering, P. Universidad Católica de Chile.

2006 **Merit & A***, in the Cambridge Advanced International Certificate of Education Diploma.

Other Activities

Videogames Development

Hobby *2008 to date*

- Created videogames for personal entertainment, one which had a 6 hour gameplay.

CEIJA — Center for Japanese Studies *Santiago, Chile*

Japanese Language Student *Aug. 2014 — Jun. 2016*

- Studied Japanese language for two years.

Online Courses

Coursera *Mar. 2016*

- **Introduction to Neuroeconomics: How the Brain Makes Decisions** *(Higher School of Economics)*: 18–27 hours of coursework. Economics, psychology, and neuroscience are converging today into a unified discipline of Neuroeconomics with the ultimate aim of creating a single, general theory of human decision-making.
- **Gamification** *(University of Pennsylvania)*: 24–48 hours of coursework. Gamification is the application of game elements and digital game design techniques to non-game problems, such as business and social impact challenges.