

# Thiago Serra

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## RESEARCH INTERESTS

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Theory and applications of artificial intelligence, machine learning, and mathematical optimization.

## EDUCATION

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Ph.D.	<i>Operations Research</i>	<b>Carnegie Mellon University</b>	2018	Advisor: J. Hooker
	♦ Gerald L. Thompson Dissertation Award in Management Sciences			
M.S.	<i>Operations Research</i>	<b>Carnegie Mellon University</b>	2015	
M.S.	<i>Computer Science</i>	<b>University of Sao Paulo</b>	2012	Advisor: Y. Wakabayashi
B.S.	<i>Computer Engineering</i>	<b>University of Campinas</b>	2008	Advisor: A. V. Moura
	♦ SBC Outstanding Student Award, IE Award, CREA Honorable Mention			
Certificate of Studies Abroad	<b>IST, University of Lisbon</b>		2007	

## ACADEMIC POSITION

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**Bucknell University**, Lewisburg, PA  
*Assistant Professor of Analytics and Operations Management* August 2019 – Present

## INDUSTRY, CONSULTING, AND VISITING POSITIONS

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<b>Mitsubishi Electric Research Labs</b> , Cambridge, MA	
<i>Visiting Research Scientist</i>	June 2018 – June 2019
<i>Summer Intern</i>	May 2017 – August 2017
<i>Summer Intern</i>	May 2016 – August 2016
<b>Petrobras</b> , Sao Paulo, SP, Brazil	
<i>Operations Research Analyst</i>	June 2009 – June 2013
<b>Neolog</b> , Sao Paulo, SP, Brazil	
<i>Consultant</i>	June 2008 – June 2009

## PUBLICATIONS

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### Refereed Journal Papers

1. E. Balas and T. Serra:  
When Lift-and-Project Cuts are Different.  
To appear in *INFORMS Journal on Computing*. Accepted in 10/2019.
2. T. Serra and J. Hooker:  
Compact Representation of Near-Optimal Integer Programming Solutions.  
To appear in *Mathematical Programming*. Accepted in 03/2019.

### Refereed International Conference Papers

3. T. Serra, A. Kumar, and S. Ramalingam:  
Lossless Compression of Deep Neural Networks.  
In *Proceedings of the 17<sup>th</sup> International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR 2020)*.  
Acceptance rate: TBA
4. T. Serra:  
Enumerative Branching with Less Repetition.  
In *Proceedings of the 17<sup>th</sup> International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR 2020)*.  
Acceptance rate: TBA
5. T. Serra and S. Ramalingam:  
Empirical Bounds on Linear Regions of Deep Rectifier Networks.  
In *Proceedings of the 34<sup>th</sup> AAAI Conference on Artificial Intelligence (AAAI 2020)*.  
Acceptance rate: 20.6%
6. T. Serra, A. Raghunathan, D. Bergman, J. Hooker, and S. Kobori:  
Last-Mile Scheduling Under Uncertainty.  
In *Proceedings of the 16<sup>th</sup> International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR 2019)*.  
Acceptance rate: 44.8%
7. T. Serra, C. Tjandraatmadja, and S. Ramalingam:  
Bounding and Counting Linear Regions of Deep Neural Networks.  
In *Proceedings of the 35<sup>th</sup> International Conference on Machine Learning (ICML 2018)*.  
Acceptance rate: 25.1%  
♦ Princeton Day of Optimization Best Poster Award: Optimization and Machine Learning
8. A. Raghunathan, D. Bergman, J. Hooker, T. Serra, and S. Kobori:  
The Integrated Last-Mile Transportation Problem (ILMTP).  
In *Proceedings of the 28<sup>th</sup> International Conference on Automated Planning and Scheduling (ICAPS 2018)*.  
Acceptance rate: 33.0%
9. T. Serra, G. Nishioka, F. Marcellino:  
The Offshore Resources Scheduling Problem: Detailing a Constraint Programming Approach.

In *Proceedings of the 18<sup>th</sup> International Conference on Principles and Practice of Constraint Programming (CP 2012)*.

Acceptance rate: 36.6%

### **Currently Under Review**

10. T. Serra:  
Reformulating the Disjunctive Cut Generating Linear Program.  
Submitted to *Annals of Operations Research*; major review in 01/2020.  
♦ **INFORMS 2016 Annual Meeting Interactive Presentation Award First Place Winner**
11. T. Serra, T. Huang, A. Raghunathan, D. Bergman:  
Template-based Minor Embedding for Adiabatic Quantum Optimization.  
Submitted to *INFORMS Journal on Computing*; minor review in 01/2020.
12. A. Raghunathan, D. Bergman, J. Hooker, T. Serra, and S. Kobori:  
Seamless Multimodal Transportation Scheduling.  
Submitted to *INFORMS Journal on Computing*; major review in 11/2019.
13. T. Serra, R. J. O'Neil:  
Seamless benchmarking of mathematical optimization problems and metadata extensions.  
Submitted to *SN Operations Research Forum*; major review in 03/2020.

### **Patent Filed**

14. A. Raghunathan, D. Bergman, and T. Serra  
Systems and Methods for Joint Control of Multi-Modal Transportation Networks  
U.S. Patent Application 15/785,540, filed October 2017 (pending)

### **AWARDS AND HONORS**

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2018 Carnegie Mellon Univ. Gerald L. Thompson Doctoral Dissertation Award in Management Science

2018 Princeton Day of Optimization Best Poster Award: Optimization and Machine Learning

2016 INFORMS Judith Liebman Award

2016 INFORMS Annual Meeting Interactive Presentation Award First Place Winner

2011 Brazilian Symposium on Operations Research Best Paper Finalist

### **Undergraduate**

2009 Brazilian Computing Society (SBC) Outstanding Student Award

2009 Sao Paulo Institute of Engineering (IE) Award

2009 Sao Paulo Reg. Board of Engineering, Architecture, and Agronomy (CREA) Honorable Mention

2007 ACM International Collegiate Programming Contest South America Bronze Medal

2006 Portuguese National Programming Contest (MIUP) Third Place

2005 ACM International Collegiate Programming Contest South America Bronze Medal

2004 ACM International Collegiate Programming Contest South America Bronze Medal

2003 Brazilian Olympiad in Informatics Gold Medal

## **FELLOWSHIPS, GRANTS, AND SCHOLARSHIPS**

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2018	Carnegie Mellon Gerald L. Thompson Doctoral Dissertation Award
2018	MIP Workshop Travel Support
2018	Carnegie Mellon Graduate Student Conference Funding
2017	MIP Workshop Travel Support
2017	Carnegie Mellon Graduate Student Conference Funding
2016	INFORMS Annual Meeting Interactive Presentation Award
2015	Tepper School of Business Dean's Fund
2013–2017	William Larimer Mellon Fellowship
2006–2007	Luso-American Development Foundation Scholarship
2004–2005	Sao Paulo Res. Fndn. Undergraduate Res. Grant
2003–2004	Sao Paulo Res. Fndn. Innovative Res. in Small Business Grant

## **INVITED PRESENTATIONS**

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May 2021	MIP 2021 workshop
Feb 2021	UCLA, Institute for Pure and Applied Mathematics
Jul 2020	ORAI China webinar
<b>Past</b>	
Feb 2020	Google, New York City office
Aug 2019	Carnegie Mellon University, YinzOR 2019 featured speaker
Jul 2019	University of Campinas, Institute of Computing
May 2019	UCLA, Institute for Pure and Applied Mathematics
Apr 2019	Brown University, Computer Science Department
Mar 2019	University of Massachusetts Amherst, INFORMS Student Chapter
Dec 2018	Rensselaer Polytechnic Institute, Industrial and Systems Engineering
Dec 2018	Bucknell University, Freeman College of Management
Oct 2018	The University of Utah, School of Computing
Oct 2018	Colby College, Mathematics and Statistics Department
Jun 2018	Mitsubishi Electric Research Laboratories
Mar 2018	Carnegie Mellon University, Process Systems Engineering
Feb 2018	Brookhaven National Laboratory, Computational Science Initiative
Jun 2017	Northeastern University, INFORMS Student Chapter

## TEACHING EXPERIENCE

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### Bucknell University

ANOP 203: Intro. to Programming for Business Analytics Undergraduate Instructor  
Spring 2020: 22 students  
Fall 2019: 21 students

MGMT 102: Quantitative Reasoning for Managers Undergraduate Instructor  
Spring 2020: 23 students  
Fall 2019: 21 students

### Carnegie Mellon University

70460: Mathematical Models for Consulting Undergraduate Instructor  
Fall 2016: 25 students

45751: Optimization MBA Recitation Leader  
Spring 2017  
Spring 2016

06805: Disjunctive Programming PhD Teaching Assistant  
Spring 2016

45751: Optimization MBA Teaching Assistant  
Fall 2015

45850: Applications of Operations Research MBA Teaching Assistant  
Fall 2015

### University of Campinas

MC 326: File Structures Undergraduate Teaching Assistant  
Fall 2006

## TEACHING-RELATED TRAINING

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<i>Teaching Circles</i>	<b>Teaching and Learning Center, Bucknell University</b>	2020
<i>Course Design and Pedagogy Workshop</i>	<b>Teaching and Learning Center, Bucknell University</b>	2019
<i>Future Faculty Program</i>	<b>Eberly Center, Carnegie Mellon University</b>	2014–17
<i>Teaching Effectiveness Colloquium</i>	<b>INFORMS</b>	2017
<i>Teaching Effectiveness Colloquium</i>	<b>INFORMS</b>	2016
<i>Acting for Non-Majors</i>	<b>School of Drama, Carnegie Mellon University</b>	2015
<i>Language and Culture for Teaching</i>	<b>ICC, Carnegie Mellon University</b>	2013

## **PROFESSIONAL SERVICE**

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### **Conferences**

- Track Chair, INFORMS Optimization Society Conference 2020
- Program Committee, AAAI Conference on Artificial Intelligence (AAAI) 2020
- Program Committee, Learning and Intelligent Optimization Conference (LION) 2020
- Academic Job Market Panel, INFORMS Annual Meeting 2019
- Twitter Curator, International Symposium on Mathematical Programming (ISMP) 2015
- Blogger, INFORMS Annual Meeting 2012 – Present

### **Awards**

- Committee Chair, INFORMS Undergraduate Operations Research Prize, 2020
- Committee Member, INFORMS Undergraduate Operations Research Prize, 2018 – 2019

### **Professional Organizations**

- Member, INFORMS Education Strategy Committee, 2017 – Present
- Consulting Board Member, INFORMS Student Chapter at Carnegie Mellon, 2017 – 2018
- President, INFORMS Student Chapter at Carnegie Mellon 2015 – 2017
  - ♦ 2017 INFORMS Student Chapter Award: Magna Cum Laude
  - ♦ 2016 INFORMS Student Chapter Award: Suma Cum Laude
  - ♦ 2016 INFORMS Judith Liebman Award
- Co-Founder and Secretary, INFORMS Student Chapter at Carnegie Mellon, 2014 – 2015

### **Journal Peer Review**

- Annals of Operations Research
- Constraints
- International Transactions in Operational Research
- Journal of Global Optimization
- Mathematical Programming
- Transportation Research B: Methodological

### **Conference Peer Review**

- AAAI Conference on Artificial Intelligence (AAAI) 2017, 2020
- American Control Conference (ACC) 2020
- International Conference on Principles and Practice of Constraint Programming (CP) 2016, 2017
- International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR) 2017, 2018, 2019
- Learning and Intelligent Optimization Conference (LION) 2020

## **REFERENCES**

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Available upon request.