

## Alessandro Arlotto

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### Research Interests

Applied probability, stochastic modeling, stochastic dynamic programming, combinatorial optimization, and applications to management sciences and economics.

### Education

UNIVERSITY OF PENNSYLVANIA, Philadelphia, PA  
Ph.D. in Managerial Science and Applied Economics, December 2012  
Dissertation Title: “Essays in Problems of Optimal Sequential Decisions”  
Advisors: Noah Gans, J. Michael Steele

UNIVERSITY OF PENNSYLVANIA, Philadelphia, PA  
A.M. in Statistics, December 2009  
Thesis: “Risk-Neutral Pricing with Switching Volatility”  
Advisor: J. Michael Steele

UNIVERSITY OF TORINO, Torino, Italy  
Laurea Specialistica (M.S.) *cum laude* in Finance, July 2007  
Thesis: “Stochastic Orders and Multinormal Distributions”  
Advisors: Marco Scarsini, Igor Prünster

UNIVERSITY OF TORINO, Torino, Italy  
Laurea Triennale (B.S.) *cum laude* in Economics and Business, November 2004  
Thesis: “Comparisons among Electoral Systems”  
Advisor: Marco Scarsini

### Professional Experience

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|----------------|---|
| 2016 – present | <i>Associate Professor of Business Administration, Mathematics, and Statistical Science</i><br>Decision Sciences, The Fuqua School of Business, Duke University<br>Department of Mathematics (secondary), Duke University<br>Department of Statistical Science (secondary), Duke University |
| 2012 – 2016    | <i>Assistant Professor of Business Administration</i><br>Decision Sciences, The Fuqua School of Business, Duke University   |
| 2015 November  | <i>Visiting Scholar</i><br>Department of Economics and Finance, LUISS Guido Carli   |
| 2015 January   | <i>Visiting Scholar</i><br>CMS–EMS, Kellogg School of Management, Northwestern University   |

2012 June	<i>Visiting Scholar</i> Statistics Initiative, Collegio Carlo Alberto
2011 March	<i>Visiting Scholar</i> Technology & Operations Management, INSEAD
2010 September	<i>Visiting Scholar</i> Statistics Initiative, Collegio Carlo Alberto

### Grants Funded

1. NATIONAL SCIENCE FOUNDATION, CAREER AWARD, “The effects of centralized and decentralized sequential decisions on system performance,” award no. 1553274, amount \$500,000, 5/01/2016–4/30/2021.
2. NATIONAL SCIENCE FOUNDATION, “Conference on Probability Theory and Combinatorial Optimization,” award no. 1502471, amount \$19,000, 2/01/2015–1/31/2016.

### Submitted Papers

1. ARLOTTO, A. and GURVICH, I. (2017) Uniformly bounded regret in the multi-secretary problem, *under review*.

### Refereed Publications

2. ARLOTTO, A., FRAZELLE, A. E., and WEI, Y. (2018) Strategic open routing in service networks, *Management Science*, forthcoming.
  - Finalist in the 2016 M&SOM Student Paper Competition (Entrant: A. E. Frazelle)
3. ARLOTTO, A., and STEELE, J. M. (2018) A central limit theorem for costs in Bulinskaya’s inventory management problem when deliveries face delays, *Methodology and Computing in Applied Probability*, forthcoming.
4. ARLOTTO, A., WEI, Y., and XIE, X. (2018) An adaptive  $O(\log n)$ -optimal policy for the online selection of a monotone subsequence from a random sample, *Random Structures & Algorithms*, **52**, 41–53.
5. ARLOTTO, A., and STEELE, J. M. (2016) A central limit theorem for temporally non-homogenous Markov chains with applications to dynamic programming, *Mathematics of Operations Research*, **41**, 1448–1468.
6. ARLOTTO, A. and STEELE, J. M. (2016) Beardwood-Halton-Hammersley theorem for stationary ergodic sequences: a counterexample, *The Annals of Applied Probability*, **26**, 2141–2168.
7. ARLOTTO, A., MOSSEL, E., and STEELE, J. M. (2016) Quickest online selection of an increasing subsequence of specified size, *Random Structures & Algorithms*, **49**, 235–252.
8. ARLOTTO, A., NGUYEN, V. V., and STEELE, J. M. (2015) Optimal online selection of a monotone subsequence: a central limit theorem, *Stochastic Processes and their Applications*, **125**, 3596–3622.

9. ARLOTTO, A., GANS, N., and STEELE, J. M. (2014) Markov decision problems where means bound variances, *Operations Research*, **62**, 864–875.
10. ARLOTTO, A. and STEELE, J. M. (2014) Online selection of an alternating subsequence: a central limit theorem, *Advances in Applied Probability*, **46**, 536–559.
11. ARLOTTO, A., CHICK, S. E., and GANS, N. (2014) Optimal hiring and retention policies for heterogeneous workers who learn, *Management Science*, **60**, 110-129, former title: “Hiring and retention of heterogeneous workers.”
12. ARLOTTO, A., CHEN, R. W., SHEPP, L. A. and STEELE, J. M. (2011) Online selection of alternating subsequences from a random sample, *Journal of Applied Probability*, **48**, 1114-1132.
13. ARLOTTO, A. and STEELE, J. M. (2011) Optimal sequential selection of a unimodal subsequence of a random sequence, *Combinatorics, Probability and Computing*, **20**, 799-814.
14. ARLOTTO, A. and SCARSINI, M. (2009) Hessian orders and multinormal distributions, *Journal of Multivariate Analysis*, **100**, 2324-2330.

### Conference Proceedings

15. ARLOTTO, A., CHICK, S.E., and GANS, N. (2010) Optimal employee retention when inferring unknown learning curves, *Proceedings of the 2010 Winter Simulation Conference (WSC)*, 1178 – 1188.

### Invited Seminars

1. *Probability, optimization, and dynamic control*, invited talk at North Carolina State University, November 2017
2. *Probabilistic analysis of sequential decision problems*, invited talk at the 2017 ISSNAF Annual Event, Italian Embassy in Washington D.C., November 2017
3. *Uniformly bounded regret in the multi-secretary problem*, invited talk at Dartmouth College, Tuck School of Business, October 2017
4. *Probabilistic analysis of finite-horizon Markov decision problems*, invited talk at Université de Montréal, First Joint CRM-IMPA Workshop, July 2017
5. *Uniformly bounded regret in the multi-secretary problem*, invited talk at Università Bocconi, Department of Decision Sciences, May 2017
6. *A central limit theorem for temporally non-homogenous Markov chains with applications to dynamic programming*, invited talk at Columbia University, Department of Industrial Engineering and Operations Research and Columbia Business School, November 2016
7. *A central limit theorem for temporally non-homogenous Markov chains with applications to dynamic programming*, invited talk at Tsinghua University, Mostly OM Workshop,

May 2016

8. *A central limit theorem for temporally non-homogenous Markov chains with applications to dynamic programming*, invited talk at Carnegie Mellon University, Tepper School of Business, April 2016
9. *A central limit theorem for temporally non-homogenous Markov chains with applications to dynamic programming*, invited talk at Georgia Institute of Technology, School of Mathematics, January 2016
10. *A central limit theorem for temporally non-homogenous Markov chains with applications to dynamic programming*, invited talk at Cornell University, School of Operations Research and Information Engineering, December 2015
11. *A central limit theorem for temporally non-homogenous Markov chains with applications to dynamic programming*, invited talk at Università degli Studi di Roma Tor Vergata, Department of Mathematics, November 2015
12. *Markov decision problems where means bound variances*, invited talk at LUISS Guido Carli, Department of Economics and Finance, October 2015
13. *Markov decision problems where means bound variances*, invited talk at Duke University, The Fuqua School of Business, August 2015
14. *A central limit theorem for temporally non-homogenous Markov chains with applications to dynamic programming*, invited talk at Duke University, The Fuqua School of Business, April 2015
15. *A central limit theorem for temporally non-homogenous Markov chains with applications to dynamic programming*, invited talk at Collegio Carlo Alberto, February 2015
16. *Markov decision problems where means bound variances*, invited talk at Southern Methodist University, Cox School of Business, April 2014
17. *Markov decision problems where means bound variances*, invited talk at University of North Carolina at Chapel Hill, Department of Statistics and Operations Research, December 2013
18. *Optimal hiring and retention policies for heterogeneous workers who learn*, invited talk at Singapore University of Technology and Design, Engineering Systems and Design, November 2013

19. *Distributional results for Markov decision problems*, invited talk at National University of Singapore, Department of Statistics and Applied Probability, November 2013
20. *Markov decision problems where means bound variances*, invited talk at INSEAD, Decision Sciences, November 2013
21. *Distributional results for Markov decision problems*, invited talk at Duke University, Department of Mathematics, February 2013
22. *Online selection of an alternating subsequence: a central limit theorem*, invited talk at Università degli Studi di Torino, Department of Mathematics, December 2012
23. *Markov decision problems where means bound variances*, invited talk at Università degli Studi di Milano-Bicocca, June 2012
24. *Markov decision problems where means bound variances*, invited talk at University of Florida, Department of Industrial and Systems Engineering, March 2012
25. *Optimal hiring and retention policies for heterogeneous workers who learn*, invited talk at Universitat Pompeu Fabra, Department of Economics and Business, February 2012
26. *Optimal hiring and retention policies for heterogeneous workers who learn*, invited talk at Collegio Carlo Alberto, February 2012
27. *Markov decision problems where means bound variances*, invited talk at Università Bocconi, Department of Decision Sciences, February 2012
28. *Markov decision problems where means bound variances*, invited talk at Northwestern University, Kellogg School of Management, February 2012
29. *Optimal hiring and retention policies for heterogeneous workers who learn*, invited talk at London Business School, Management Science and Operations, February 2012
30. *Markov decision problems where means bound variances*, invited talk at Pennsylvania State University, Department of Industrial and Manufacturing Engineering, February 2012
31. *Markov decision problems where means bound variances*, invited talk at University of Minnesota, Department of Industrial & Systems Engineering, January 2012
32. *Markov decision problems where means bound variances*, invited talk at Duke University, The Fuqua School of Business, January 2012

33. *Markov decision problems where means bound variances*, invited talk at Georgetown University, McDonough School of Business, January 2012
34. *Markov decision problems where means bound variances*, invited talk at Columbia University, Columbia Business School, January 2012
35. *Markov decision problems where means bound variances*, invited talk at New York University, Stern School of Business, January 2012
36. *Markov decision problems where means bound variances*, invited talk at University of Chicago, Booth School of Business, January 2012
37. *Optimal hiring and retention policies for heterogeneous workers who learn*, invited talk at Indiana University, Kelley School of Business, January 2012
38. *Markov decision problems where means bound variances*, invited talk at Massachusetts Institute of Technology, Sloan School of Management, December 2011
39. *Markov decision problems where means bound variances*, invited talk at University of Pennsylvania, The Wharton School, December 2011
40. *Optimal hiring and retention policies for heterogeneous workers who learn*, invited talk at INSEAD, Technology & Operations Management, March 2011
41. *Hessian orders and multinormal distributions*, invited talk at George Washington University, Department of Statistics, April 2010

### Conference Presentations

*A  $O(\log n)$ -optimal policy for the dynamic and stochastic knapsack problem with equal values*  
 2017 Conference on Stochastic Processes and their Applications (Moscow, Russia)  
 2017 INFORMS Applied Probability Society Conference (Evanston, IL)

*Uniformly bounded regret in the multi-secretary problem*  
 2017 INFORMS Applied Probability Society Conference (Evanston, IL)

*A central limit theorem for temporally non-homogenous Markov chains with applications to dynamic programming*  
 2016 INFORMS Annual Meeting (Nashville, TN)  
 2015 INFORMS Annual Meeting (Philadelphia, PA)  
 2015 INFORMS Applied Probability Society Conference (Istanbul, Turkey)  
 2015 International Workshop on Sequential Methodologies (New York, NY)

*A central limit theorem for costs in Bulinskaya's inventory management problem when deliveries face delays*  
 2016 INFORMS International Conference (Waikoloa, HI)

*Optimal online selection of a monotone subsequence: a central limit theorem*  
2015 INFORMS Applied Probability Society Conference (Istanbul, Turkey)

*Markov decision problems where means bound variances*  
2014 Conference on Stochastic Processes and their Applications (Buenos Aires, Argentina)  
2012 INFORMS Annual Meeting (Phoenix, AZ)  
2012 IWAP - International Workshop in Applied Probability (Jerusalem, Israel)  
2011 INFORMS Annual Meeting (Charlotte, NC)

*Online selection of an alternating subsequence: a central limit theorem*  
2013 INFORMS Applied Probability Society Conference (San Jose, Costa Rica)  
2013 Seminar on Stochastic Processes (Durham, NC)

*Optimal hiring and retention policies for heterogeneous workers who learn*  
2014 INFORMS Annual Meeting (San Francisco, CA)  
2011 INFORMS Annual Meeting (Charlotte, NC)  
2011 MSOM Special Interest Group Meeting (Ann Arbor, MI)  
2010 INFORMS Annual Meeting (Austin, TX)  
2009 INFORMS Annual Meeting (San Diego, CA)  
2009 INFORMS Applied Probability Society Conference (Ithaca, NY)  
2009 MSOM Annual Conference (Cambridge, MA)

*On the sequential selection of monotone, unimodal and alternating subsequences from a random sample*  
2011 INFORMS Applied Probability Society Conference (Stockholm, Sweden)  
2010 INFORMS Annual Meeting (Austin, TX)

*Hessian orders and multinormal distributions*  
2009 Fields–MITACS Summer School in Applied Probability (Ottawa, Canada)  
2008 International Workshop on Matrices and Statistics (Tomar, Portugal)

## Teaching Experience

Spring 2017	Duke University, The Fuqua School of Business, Durham, NC BA915/MATH742/STA715: Stochastic Models (Ph.D.)
Fall 2016	Duke University, The Fuqua School of Business, Durham, NC DEC610: Probability and Statistics (Daytime MBA, 3 sections)
Fall 2015	Duke University, The Fuqua School of Business, Durham, NC DEC610: Probability and Statistics (Daytime MBA, 3 sections)
January 2015	Northwestern University, Kellogg School of Management, Evanston, IL Mini-course on Bandit Models (Ph.D.)
Fall 2014	Duke University, The Fuqua School of Business, Durham, NC DEC610: Probability and Statistics (Daytime MBA, 3 sections) BA998: Special Topics in Decision Sciences (Ph.D.)

- Summer 2014 Duke University, The Fuqua School of Business, Durham, NC  
DEC516F/516K: Quantitative Business Analysis (MMS, 2 sections)
- Fall 2013 Duke University, The Fuqua School of Business, Durham, NC  
DEC610: Probability and Statistics (Daytime MBA, 3 sections)
- Fall 2012 Duke University, The Fuqua School of Business, Durham, NC  
DEC610W: Probability and Statistics (Weekend MBA, 2 sections)
- Summer 2011 University of Pennsylvania, The Wharton School, Philadelphia, PA  
Wharton Summer Math Camp (Ph.D. course)
- Summer 2010 University of Pennsylvania, The Wharton School, Philadelphia, PA  
Wharton Summer Math Camp (Ph.D. course)
- Summer 2009 University of Pennsylvania, The Wharton School, Philadelphia, PA  
Wharton Summer Math Camp (Ph.D. course)
- Spring 2009 University of Pennsylvania, The Wharton School, Philadelphia, PA  
OPIM415: Product Design (Teaching Assistant)
- Fall 2008 University of Pennsylvania, The Wharton School, Philadelphia, PA  
OPIM690: Managerial Decision Making (Teaching Assistant)
- 2003 – 2006 University of Torino, Torino, Italy  
Calculus for Business and Economics (Teaching Assistant)

### **Academic Service**

Member of the *Academic Council*, Duke University, 2017–2019

Member of the *Faculty Advisory Committee*, The Fuqua School of Business, Duke University, 2017–2019

Organizer of the *Decision Sciences Seminar Series*, The Fuqua School of Business, Duke University, 2012–present

Organizer of *WORDS: Workshop in Operations Research and Data Science*, Duke University, 2017

Organizer and Chair for the *invited session* “Stochastic Optimization in Applied Probability,” 2017 INFORMS Annual Meeting, Houston, TX

Organizer and Chair for the *session* “Sequential Methods in Probability,” 39th Conference on Stochastic Processes and their Applications, Moscow, Russia, 2017

Organizer and Chair for the *invited session* “Sequential Decisions and Optimal Stopping,” 2017 INFORMS Applied Probability Society Conference, Evanston, IL



Member of the *Program Committee*, 2017 INFORMS Applied Probability Society Conference, Evanston, IL

Organizer of the *2017 Southeastern Probability Conference*, Duke University

Organizer and Chair for the *invited session* “Probabilistic Combinatorial Optimization,” 2016 INFORMS Annual Meeting, Nashville, TN

Faculty sponsor for *Data+: Smart(er) Routing at Theme Parks*, undergraduate research experience, Information Initiative at Duke University, 2016

Member of the *Faculty Advisory Committee*, The Fuqua School of Business, Duke University, 2013–2016

Organizer for the *invited session* “New Directions in Applied Probability,” 2015 INFORMS Applied Probability Society Conference, Istanbul, Turkey

Member of the *Program Committee*, 2015 INFORMS Applied Probability Society Conference, Istanbul, Turkey

Organizer of the *Duke Conference on Probability Theory and Combinatorial Optimization*, The Fuqua School of Business, Duke University, 2015

Organizer for the *Fuqua Summer Seminar Series*, 2014–2015

Organizer and Chair for the *invited session* “Probability Theory and Combinatorial Optimization,” 2014 INFORMS Annual Meeting, San Francisco, CA

Member of the *Decision Sciences Ph.D. Program Progress Committee*, 2012–2014

Member of the *Decision Sciences Ph.D. Admission Committee*, 2012–2014

Organizer for the *invited session* “Markov Chains and Markov Decision Problems,” 2013 INFORMS Applied Probability Society Conference, San José, Costa Rica

Member of the *Program Committee*, 2013 INFORMS Applied Probability Society Conference, San José, Costa Rica

## **Honors and Awards**

National Science Foundation, Faculty Early Career Development (CAREER) Award, 2016–2021

Finalist for the Anna Molteni Award presented by the Italian Scientists and Scholars in North America Foundation, 2017

Award for Innovation and Excellence in Teaching, Master in Management Studies, Duke-Kunshan University, 2015

Wharton Doctoral Fellowship in Decision Sciences, 2010–2011

Wharton Doctoral Fellowship, 2007–2010, 2011–2012

Wharton Ph.D. Student Travel Grant, 2008, 2011

Fields Institute Travel Grant, 2009

“Patty and Jay H. Baker” Endowed Ph.D. Fellowship, 2009

### **Professional Activities**

Associate Editor for *Operations Research* (2018-present)

Reviewer for *Advances in Applied Probability*, *Decision Analysis*, *European Journal of Operations Research*, *Journal of Applied Probability*, *Journal of the Royal Statistical Society*, *Management Science*, *Manufacturing & Service Operations Management*, *Methodology and Computing in Applied Probability*, *MSOM Sig Conference*, *Mathematical Reviews (AMS)*, *Mathematics of Operations Research*, *National Science Foundation*, *Omega*, *Operations Research*, *Operations Research Letters*, *Production and Operations Management*, *Theory and Decision*

Panelist for *National Science Foundation*

Member of Institute of Operations Research and Management Science (INFORMS), Institute of Mathematical Statistics (IMS)

### **Summer Schools**

Cornell Probability Summer School, Cornell University, Ithaca, NY, 2009

Fields–MITACS Summer School in Applied Probability, Carleton University, Ottawa, Canada, 2009

SMI – Summer School in Mathematics, Perugia, Italy, 2006, 2007

### **Languages**

Italian (native), English (fluent)

### **Computer Skills and Interests**

Matlab, Mathematica, R, Visual Basic, Html, Sql, L<sup>A</sup>T<sub>E</sub>X

### **References**

Available upon request

### **Immigration**

Italian Citizen; U.S. Permanent Resident