

# Dr. Julie Nutini

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## EDUCATION

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- MAY 2018 | **PhD in COMPUTER SCIENCE**, UBC, Vancouver, BC  
Thesis: *"Greed is Good: Greedy Optimization Methods for Large-Scale Structured Problems"*  
ADVISOR: DR. MARK SCHMIDT  
SUBJECTS STUDIED: coordinate descent methods, convex/nonsmooth optimization
- APR 2012 | **MSc in MATHEMATICS**, UBC (Okanagan), Kelowna, BC  
Thesis: *"A derivative-free approximate gradient sampling algorithm for finite minimax problems"*  
ADVISOR: DR. WARREN HARE  
SUBJECTS STUDIED: derivative-free optimization, convex optimization
- APR 2010 | **BSc in MATHEMATICS (honors)**, UBC (Okanagan), Kelowna, BC  
MAJOR: GENERAL MATHEMATICS  
SUBJECTS STUDIED: calculus, linear algebra, real analysis, number theory, statistics

## RESEARCH/WORK EXPERIENCE

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- OCT 2021 -  
CURRENT | **Senior Scientist, SAR Specialist**, Planet Labs  
Research and development of data fusion algorithms, specifically for synthetic aperture radar data.  
TECHNICAL MANAGER: RASMUS HOUBORG
- JUL 2021 -  
SEPT 2021 | **Senior Software Engineer, Numerical Optimization**, EarthDaily Analytics  
Responsible for gathering requirements, planning, designing, executing, evaluating and evolving numerical optimization solutions to remote sensing problems.  
TECHNICAL MANAGER: IBRAHIM MUHAMMAD
- APRIL 2019 -  
JUN 2021 | **Machine Learning Scientist III**, EarthDaily Analytics  
Responsible for facilitating internal and external stakeholder engagement, gathering requirements, planning, designing, executing, evaluating and evolving machine learning (ML) solutions to problems.  
TECHNICAL MANAGER: IBRAHIM MUHAMMAD
- AUG 2018 -  
APRIL 2019 | **SAR Performance Analyst**, UrtheCast  
Development of a software package for determining operational parameters for synthetic aperture radar to be used as an engineering tool, as well as an analytical tool to support business development.  
ADVISOR: ROGER KORUS
- OCT 2014 -  
APR 2018 | **Research Consultant**, UrtheCast  
Provide input/analysis within the scope of optimization and numerical methods for multi-focused research projects related to the operation of synthetic aperture radar.  
ADVISOR: DR. PETER FOX
- JAN 2017 -  
JUNE 2018 | **Research Assistant**, UBC  
ADVISOR: DR. MARK SCHMIDT
- JUN -  
OCT 2014 | **MITACS Accelerate Internship**, UrtheCast  
ADVISOR: DR. PETER FOX
- MAY -  
AUG 2011 | **Graduate Research Assistant**, UBC (Okanagan)  
ADVISORS: DR. WARREN HARE, DR. SOLOMON TESFAMARIAM

## TEACHING EXPERIENCE

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- JAN 2013 - APR 2014 | **Graduate Teaching Assistant, UBC**  
CPSC 402: Numerical Linear Algebra  
CPSC 303: Numerical Approximation and Discretization  
Required to hold office hours, mark assignments, midterms and finals.
- JAN - APR 2012 | **Graduate Teaching Assistant, UBC (Okanagan)**  
MATH 111: Finite Mathematics  
Required to teach 3 tutorial sections each week, reiterating difficult lecture concepts and assisting students with assignment problems.
- SEPT 2010 - APR 2012 | **Coordinator/Graduate Teaching Assistant, UBC (Okanagan)**  
MATH 100/101: Calculus I and II  
Required to create lab materials for TAs, teach 1 lab each week (Sept 2010 - Dec 2011), organize schedules for marking/invigilating midterm/final exams and correspond with professors.
- SEPT 2009 - APR 2010 | **Undergraduate Teaching Assistant, UBC (Okanagan)**  
MATH 100/101: Calculus I and II  
Required to teach 6 lab sections each week with tutorials based on the computer program *Maple*, mark biweekly assignments/quizzes and assist professors with exam invigilation and marking.

## FELLOWSHIPS, SCHOLARSHIPS AND AWARDS

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- 2019 **CS-Can/Info-Can Distinguished Dissertation Award - PhD**
- 2017 **Best Reviewer Award**  
Conference on Neural Information Processing Systems (NeurIPS)
- 2016 **Certificate of Highly Cited Research - *Advances in Engineering Software***  
For: "A survey of non-gradient optimization methods in structural engineering"
- PhD:**
- 2012-2016 **UBC Four Year Fellowship**
  - 2012-2016 **Faculty of Science Graduate Award**
  - 2012-2015 **Natural Sciences and Engineering Research Council of Canada (NSERC) Alexander Graham Bell Canada Graduate Scholarship**
- MSc:**
- 2012 **Governor General's Academic Gold Medal (Sciences) International Travel Grant**
  - 2011 **Graduate Scholarship Graduate Fellowship**
  - 2010 **Graduate Entrance Scholarship**
- BSc:**
- 2009 **Canadian Federation of University Women Scholarship**
  - 2008, 2009 **Trek Excellence Scholarship**
  - 2007 **President's Entrance Scholarship**
- Other:**
- 2006 **Governor General's Academic Bronze Medal (secondary school)**

## PUBLICATIONS ( \*AUTHORS LISTED ALPHABETICALLY)

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- J. Nutini, I. Laradji and M. Schmidt. "Let's Make Block Coordinate Descent Converge Faster: Faster Greedy Rules, Message-Passing, Active-Set Complexity, and Superlinear Convergence", *JMLR*, 2022 [\[pdf\]](#).
- Y. Sun, H. Jeong, J. Nutini and M. Schmidt. "Are we there yet? Manifold identification of gradient related proximal methods", *Proceedings of the 22nd International Conference on Artificial Intelligence and Statistics*, 2019 [\[pdf\]](#).
- J. Nutini, M. Schmidt and W. Hare. "'Active-set complexity' of proximal gradient: How long does it take to find the sparsity pattern?", *Optimization Letters*, 2018 [\[pdf\]](#).
- I. Laradji, J. Nutini and M. Schmidt. "Graphical Newton for Huge-Block Coordinate Descent on Sparse Graphs", *NIPS Optimization Workshop*, 2017.

H. Karimi, J. Nutini and M. Schmidt. “Linear Convergence of Gradient and Proximal-Gradient Methods Under the Polyak-ojasiewicz Condition”, *ECML-PKDD*, 2016 [\[arXiv\]](#).

J. Nutini, B. Sepehry, I. H. Laradji, M. Schmidt, H. Koepke and A. Virani. “Convergence Rates for Greedy Kaczmarz Algorithms, and Faster Randomized Kaczmarz Rules Using the Orthogonality Graph”, *UAI*, 2016 [\[arXiv\]](#).

J. Nutini, M. Schmidt, I. H. Laradji, M. Friedlander and H. Koepke. “Coordinate Descent Converges Faster with the Gauss-Southwell Rule Than Random Selection”, *ICML*, 2015 [\[arXiv\]](#).

\* K. Bigdeli, W. Hare, J. Nutini and S. Tesfamariam. “Optimizing Damper Connectors for Adjacent Buildings”, *Optimization and Engineering*, 17(1):47-75, 2016 [\[pdf\]](#).

\* W. Hare, J. Nutini and S. Tesfamariam. “A survey of non-gradient optimization methods in structural engineering”, *Advances in Engineering Software*, 59:19-28, 2013 [\[pdf\]](#).

\* W. Hare and J. Nutini. “A derivative-free approximate gradient sampling algorithm for finite minimax problems”, *Computational Optimization and Applications*, 56(1):1-38, 2013 [\[pdf\]](#).

## CONFERENCES

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- DEC 2022 American Geophysical Union (AGU) 2022, Chicago, Illinois, USA  
TALK: “Towards Improving the Uncertainty Estimates for Gap-Filled Planet Fusion Surface Reflectance Using SAR”
- MAY 2022 ESA Living Planet Symposium, Bonn, Germany  
TALK: “Synergistic Exploitation of Sentinel-1 in Planet Fusion”
- DEC 2017 Optimization Workshop at NIPS 2017, Long Beach, CA, USA  
PAPER & POSTER: “Active-set complexity” of proximal gradient: How long does it take to find the sparsity pattern?
- DEC 2017 Women in Machine Learning Workshop at NIPS 2017, Long Beach, CA, USA  
POSTER: *Let’s Make Block Coordinate Descent Go Fast!*
- JULY 2017 EUROPT Workshop on Advances in Continuous Optimization, Montreal, QC  
TALK: *Let’s Make Block Coordinate Descent Go Fast!*
- MAY 2017 SIAM Conference on Optimization, Vancouver, BC  
TALK: *Let’s Make Block Coordinate Descent Go Fast!*
- SEPT 2016 European Conference on Machine Learning (ECML), Riva del Garda, Italy  
TALK: *Linear Convergence of Gradient and Proximal-Gradient Methods Under the Polyak-Lojasiewicz Condition*
- AUG 2016 International Conference on Continuous Optimization (ICCOPT), Tokyo, Japan  
TALK: *Is Greedy Coordinate Descent a Terrible Algorithm?*
- JUN 2016 Conference on Uncertainty in Artificial Intelligence, New York City, NY, USA  
SPOTLIGHT/POSTER: *Convergence Rates for Greedy Kaczmarz Algorithms, and Randomized Kaczmarz Rules Using the Orthogonality Graph*
- JUN 2016 Workshop on Nonlinear Optim. Alg. and Industrial Applications, Toronto, ON  
POSTER: *Coordinate Descent Converges Faster with the Gauss-Southwell Rule Than Random Selection*
- APR 2016 SCAIM Seminar, Vancouver, BC  
TALK: *Is Greedy Coordinate Descent a Terrible Algorithm?*
- OCT 2015 West Coast Optimization Meeting, Kelowna, BC  
TALK: *Is Greedy Coordinate Descent a Terrible Algorithm?*
- JULY 2015 International Conference on Machine Learning (ICML), Lille, France  
TALK & POSTER: *Coordinate Descent Converges Faster with the Gauss-Southwell Rule Than Random Selection*
- MAR 2014 Centre for Optimization, Convex Analysis and Nonsmooth Analysis (COCANA)  
Seminar Series, Kelowna, BC  
TALK: *Putting the Curvature Back into Sparse Solvers*  
Research Proficiency Exam project. Joint work with Dr. Michael Friedlander.
- DEC 2013 SINBAD Consortium 2013 Fall Meeting, Whistler, BC  
TALK: *Putting the Curvature Back into Sparse Solvers*
- AUG 2013 Workshop on Numerical Linear Algebra & Optimization, Vancouver, BC
- JUL 2013 International Conference on Continuous Optimization, Caparica, Portugal  
TALK: *A Derivative-free Approx. Gradient Sampling Alg. for Finite Minimax Problems*
- JAN 2012 III Latin American Workshop on Optimization and Control, Valparaiso, Chile  
TALK: *A Derivative-free Approx. Gradient Sampling Alg. for Finite Minimax Problems*