

## Ron Estrin

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Email: RonEstrin756@gmail.com

Phone: (778) 558-7802

Website: <https://restrin.github.io>

### EDUCATION

**Ph.D.** in Computational and Mathematical Engineering **2014 - 2019**  
**Stanford University**, Stanford, CA

*Advisors: Michael Saunders and Yinyu Ye*

**B.Sc. with Distinction** in Combined Honours Math and Computer Science **2010 - 2014**  
**University of British Columbia**, Vancouver, BC

### ACADEMIC HONOURS AND AWARDS

**Gene Golub Doctoral Dissertation Award** **2019**

- For outstanding thesis among graduating ICME PhD class.

**Centennial Teaching Assistant Award (School of Engineering)** **2018**

- For outstanding service and dedication to classroom instruction for Stanford students.

**ICME Teaching Fellow** **2018**

- Designation recognizing students with significant teaching experience.

**SIAM Applied Linear Algebra Student Travel Award** **2018**

**ICME Excellence in Teaching Award** **2017**

- Awarded to up to two students for outstanding teaching service.

**Gene Golub Fellowship Award** **2014**

- For academic excellence and research potential for incoming ICME students.

**Governor General's Academic Silver Medal** **2014**

- For highest academic standing in UBC's Faculty of Science among graduating class.

**Dr. R. D. James Medal in Mathematics** **2014**

- For student in Math Dept. with most outstanding record and promise in the field.

**CRA Outstanding Undergraduate Award Honourable Mention** **2014**

### PROFESSIONAL EXPERIENCE

**Cerebras, Los Altos, CA** **Fall 2019 - Present**

Member of Technical Staff, Compiler Team

- Developing a fully automated compiler for distributing massively parallel workloads on the Cerebras wafer-scale engine (WSE).
- Implementing automatic code generator to translate high level computation strategies for processors connected in a 2D mesh into low-level microcode on the WSE.
- Designing algorithms for discovering efficient computation scheduling and data distribution on distributed memory architectures using techniques such as polyhedral compilation.

**Google, Mountain View, CA** **Summer 2017**

PhD Research Intern, LASER Team

- Studied new approach to low-rank matrix completion with applications to recommendation systems (such as movie or music recommendations) and word embeddings.
- Implemented high performance solver for alternating least-squares in Python using NumPy and SciPy for low-rank matrix completion.
- Demonstrated cases where proposed variant outperforms traditional low-rank matrix completion approach.

**University of British Columbia, CS Department, Vancouver, BC** **Summer 2016**

Research Assistant

- Developed family of iterative solvers for (possibly non-symmetric) saddle point systems arising from engineering problems under the supervision of Dr. Chen Greif.
- Showed methods in this new family are often competitive with existing approaches.

**Microsoft, Redmond, WA** **Summer 2015**

Software Development Engineering Intern, Elastic Scale Team

- Implemented feature for distributed database transactions in the cloud for SQL Server.

- Project was completed from scratch, with design document, testing and implementation accomplished within the internship.

**Microsoft, Redmond, WA**

**Summer 2014**

Software Development Engineering Intern, Elastic Scale Team

- Designed time synchronization scheme for Azure datacenters across the world.
- Implemented prototype of scheme in C# as Azure Cloud Service.
- Prototype achieved millisecond synchronization within datacenters, sub-second synchronization across datacenters.

**Google, Waterloo, ON**

**Summer 2013**

Google Summer Software Engineering Intern, Mobile Gmail Team

- Developer for mobile and iOS Gmail, client and server-side, working in Java, Javascript.
- Responsible for writing design documents, implementation, and testing of projects.
- Intern projects resulted in first network responses to return 75% faster than before.

**University of British Columbia, Math Department, Vancouver, BC**

**Summer 2012**

NSERC USRA Research Assistant

- Worked with Dr. Richard Anstee on problems in Extremal Hypergraph Theory.
- Discovered and proved theorems that are recorded in booklet of notes.

**PEER REVIEWED PUBLICATIONS**

1. R. Estrin, M. P. Friedlander, D. Orban, and M. A. Saunders. Implementing a smooth exact penalty function for general constrained nonlinear optimization. *SIAM J. Sci. Comput.*, 2020. Accepted for publication.
2. R. Estrin, M. P. Friedlander, D. Orban, and M. A. Saunders. Implementing a smooth exact penalty function for equality-constrained nonlinear optimization. *SIAM J. Sci. Comput.*, 2020. Accepted for publication.
3. Ron Estrin, Dominique Orban, and Michael A Saunders. Lslq: An iterative method for linear least-squares with an error minimization property. *SIAM Journal on Matrix Analysis and Applications*, 40(1):254–275, 2019.
4. Ron Estrin, Dominique Orban, and Michael A Saunders. Lnlq: An iterative method for least-norm problems with an error minimization property. *SIAM Journal on Matrix Analysis and Applications*, 40(3):1102–1124, 2019.
5. Ron Estrin, Dominique Orban, and Michael Saunders. Euclidean-norm error bounds for symmlq and cg. *SIAM Journal on Matrix Analysis and Applications*, 40(1):235–253, 2019.
6. R. Estrin and C. Greif. SPMR: a family of saddle-point minimum residual solvers. *SIAM J. Sci. Comput.*, 40(3):A1884–A1914, 2018.
7. R. Estrin and C. Greif. Towards an optimal condition number of certain augmented Lagrangian-type saddle-point matrices. *Numer. Linear Algebra Appl.*, 23(4):693–705, 2016.
8. R. Estrin and C. Greif. On nonsingular saddle-point systems with a maximally rank-deficient leading block. *SIAM J. Matrix Anal. Appl.*, 36(2):367–384, 2015.

**PAPERS IN REVIEW**

9. R. Estrin and M. P. Friedlander. A perturbation view of level-set methods for convex optimization. *Springer Optimization Letters*, 2019.

**TEACHING**

**Instructor:** CME 258: Libraries for Numerical Linear Algebra and Optimization **Spring 2018**

**Instructor:** Linear Algebra ICME Refresher Course **Summer 2016**

**Teaching Assistant:** CME 307: Optimization **Winter 2017**

**Head Teaching Assistant:** CME 302: Numerical Linear Algebra **Fall 2016, 2017**

**Teaching Assistant:** CME 302: Numerical Linear Algebra **Fall 2015**

**Undergraduate Teaching Assistant:** Math Portion of Science One **2012**

## CONFERENCE PRESENTATIONS

CAIMS Annual Meeting. Whistler, BC.	June 2019
SIAM Computational Science and Engineering. Spokane, WA.	Feb 2019
Pacific Northwest Numerical Analysis Seminar. Vancouver, BC.	Oct 2018
SIAM Annual Meeting. Portland, OR.	July 2018
SIAM Applied Linear Algebra Poster Session. Hong Kong.	May 2018
Conference on High Performance Scientific Computing. Hanoi, Vietnam.	Mar 2018
SIAM Computational Science and Engineering. Atlanta, GA.	Feb 2017
SIAM Annual Meeting Poster Session. Boston, MA.	July 2016

## SEMINAR PRESENTATIONS

UBC SCAIM Seminar. University of British Columbia.	Sept 2018
Sandia National Labs. Albuquerque, NM.	Feb 2018
Stanford LA/OPT Seminar. Stanford University.	Oct 2017
ICME Student Seminar. Stanford University.	Oct 2016

## SERVICE

**ICME Computational Consulting** **2014 - 2019**

- C<sup>2</sup> is a free consulting service offered by ICME students for the Stanford academic community for any help they may need with their computational, numerical or mathematical problems.
- Leader of C<sup>2</sup> from 2015-2017.

**UBC Math Circle Co-Leader** **2012 - 2014**

- Coordinated group of volunteers for high school outreach program.
- Oversaw development of faculty lectures and problem sets for students.

### Journal Refereeing

- ICML
- NeurIPS
- SIAM Journal on Optimization
- SIAM Journal on Matrix Analysis
- SIAM Journal on Scientific Computing
- Numerical Algorithms

## SKILLS

**Programming Languages:** Julia, MATLAB, Python, C/C++, C#, Java, L<sup>A</sup>T<sub>E</sub>X

**Languages:** English (fluent), Russian (working proficiency)

## EXTRACURRICULAR ACTIVITIES

### Taekwondo

- Competed for Stanford's Taekwondo team.
- Won the silver medal at the 40th and 42nd National Collegiate Taekwondo Championships in the red belt, welter weight division.

### Tennis

- Instructed group lessons with students ranging from children to adults.
- Competed in local tournaments up to the provincial level.