

David Titley-Péloquin

Personal Data

Citizenship: Canadian

Born: 23/11/1980, Ottawa, Canada

Languages: French (mother tongue), English, Spanish

Research Interests: Scientific computing, numerical linear algebra, numerical optimization

Contact Information

Address:

Institut de Recherche en Informatique de Toulouse (IRIT)
École Nationale Supérieure d'Électrotechnique, d'Électronique, d'Informatique, d'Hydraulique et des
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Education and Experience

Postdoctoral Positions

IRIT – ENSEEIHT, Toulouse, France **02/2012–present**

- Postdoctoral fellowship funded by the Fondation de coopération scientifique Sciences et Technologies pour l'Aéronautique et l'Espace (STAE)

Numerical Analysis Group, University of Oxford, UK **10/2010–01/2012**

- Postdoctoral fellowship funded by the Natural Sciences and Engineering Research Council of Canada (NSERC)

Doctor of Philosophy

School of Computer Science, McGill University, Montreal, Canada **09/2004–09/2010**

- Supervisors: Prof Xiao-Wen Chang and Prof Emeritus Chris Paige
- Thesis: Backward Error Analysis of Least Squares Problems
- Fast-tracked from the MSc to the PhD programme in September 2005

Bachelor of Science

McGill University, Montreal, Canada **09/1999–05/2004**

- Joint major in physics and computer science, minor in mathematics
- Graduated with great distinction and on the Dean's honour roll

Distinction

Cecil Graham Prize 2010

The award was established by the Canadian Applied and Industrial Mathematics Society (CAIMS) to recognize and publicize an outstanding PhD thesis in Applied Mathematics defended at a Canadian University during the calendar year prior to the year of the award. The award consists of a prize of 1000 \$CAD and a commemorative plaque presented at the CAIMS Annual Meeting.

[<http://www.caims.ca/Awards/DDaward.html>]

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Awards

- 2012–2013** Fondation de coopération scientifique STAE Postdoctoral Fellowship (51,120 €)
- 2010–2012** Natural Sciences and Engineering Research Council of Canada (NSERC) Postdoctoral Fellowship (80,000 \$CAD)
- 2010–2012** Mathematics of Information Technology and Complex Systems Research Network of Canada (MITACS) Elevate Postdoctoral Fellowship (110,000 \$CAD; declined to take up NSERC fellowship)
- 2006–2009** NSERC PGS-D (PhD) Graduate Fellowship (63,000 \$CAD)
- 2008** Student prize, 5th Montreal Scientific Computing Days (100 \$CAD)
- 2007** Student prize, 4th Montreal Scientific Computing Days (100 \$CAD)
- 2005–2006** NSERC PGS-M (MSc) Graduate Fellowship (21,000 \$CAD)
- 2005–2006** McGill University Graduate Studies Fellowship (5,000 \$CAD)
- 2004–2005** McGill University Graduate Studies Fellowship (5,000 \$CAD)
- 2003** NSERC Undergraduate Student Research Award (7,200 \$CAD)
- 2000–2001** James McGill Prize (1,000 \$CAD)

Publications

Publications in peer-reviewed journals and preprints:

- [1] (with S. Gratton, P. Toint, and J. Tshimanga). *Linearizing the method of conjugate gradients*. Submitted for publication (SIAM Journal on Matrix Analysis and Applications, 2012).
- [2] (with S. Gratton and P. Jiránek). *Simple backward error bounds for linear least squares problems*. Submitted for publication (Linear Algebra and its Applications, 2012).
- [3] (with J. Pestana and A. Wathen). *GMRES convergence bounds that depend on the right-hand side vector*. Submitted for publication (IMA Journal on Numerical Analysis, 2012).
- [4] (with S. Gratton and P. Jiránek). *On the accuracy of the Karlson-Walden estimate of the backward error for linear least squares problems*. SIAM Journal on Matrix Analysis and Applications, 33:3 (2012) pp. 822–836.
- [5] (with W. Qiu and M. Soleimani). *Blockwise conjugate gradient methods for image reconstruction in volumetric X-Ray CT*. Computer Methods and Programs in Biomedicine, to appear (2012).
- [6] (with P. Jiránek). *Estimating the backward error in LSQR*. SIAM Journal on Matrix Analysis and Applications, 31:4 (2010) pp. 2055–2074.
- [7] (with X.-W. Chang and C. C. Paige). *Stopping criteria for the iterative solution of linear least squares problems*. SIAM Journal on Matrix Analysis and Applications, 31:2 (2009) pp. 831–852.
- [8] (with X.-W. Chang). *Backward perturbation analysis for scaled total least squares problems*. Numerical Linear Algebra with Applications, 16 (2009) pp. 627–648.
- [9] (with X.-W. Chang and C. C. Paige). *Characterizing matrices that are consistent with given solutions*. SIAM Journal on Matrix Analysis and Applications, 30:4 (2008) pp. 1406–1420.
- [10] (with D. Avis and B. Kaluzny). *Visualizing and constructing cycles in the simplex method*. Operations Research, 56 (2008) pp. 512–518.

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Workshop Proceedings

- [1] (with L.-M. Rousseau, J.-F. Audy, N. El Hachemi, B. Gendron, P. Khuong, L. Michel and G. Rix). *Solving a combined routing and scheduling problem in forestry*. Montreal Industrial Problem Solving Workshop (2009).

Invited Seminar Presentations

- [1] *Convergence of Iterative Solution Algorithms for Linear Least Squares Problems*
- Seminar of the Academy of Sciences of the Czech Republic, Prague (2011)
- [2] *Backward Perturbation Analysis of Least Squares Problems*
- University of Bath Numerical Analysis Seminar (2011)
 - University of Manchester Numerical Analysis Seminar (2011)
 - University of Oxford Numerical Analysis Seminar (2011)
- [3] *Stopping Criteria for the Iterative Solution of Linear Least Squares Problems*
- University of Waterloo Continuous Optimization Seminar (2009)
 - Montreal Joint CSE/CRM Applied Math Seminar (2008)

Conference Presentations

- [1] *Convergence of Iterative Solution Algorithms for Linear Least Squares Problems*
- SIAM Conference on Applied Linear Algebra (Valencia, Spain, 2012)
- [2] *Backward Perturbation Analysis of Linear Least Squares Problems*
- Householder Symposium XVIII (Lake Tahoe, USA, 2011)
- [3] *Solving Linear Regression Problems Using LSQR*
- ICIAM (Vancouver, Canada, 2011)
 - International Conference of the ERCIM on Computing & Statistics (London, UK, 2010)
- [4] *Stopping Criteria for the Iterative Solution of Linear Least Squares Problems*
- CERFACS Sparse Days (Toulouse, France, 2009)
 - Householder Symposium XVII (Zeuthen, Germany, 2008)
 - 5th Montreal Scientific Computing Days (Montreal, Canada, 2008)
Student Prize: “best contributed presentation”
- [5] *Backward Perturbation Analysis for Scaled Total Least Squares Problems*
- Computational Methods with Applications (Harrachov, Czech Republic, 2007)
 - 4th Montreal Scientific Computing Days (Montreal, Canada, 2007)
Student Prize: “best contributed presentation”
- [6] *Characterizing Matrices Consistent with Given Approximate Solutions to LS, DLS, and STLS Problems*
- 4th International Workshop on TLS and EIV Modeling (Leuven, Belgium, 2006)
- [7] *Visualizing and Constructing Cycles in the Simplex Method*
- Optimization Days (Montreal, Canada, 2005)

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Teaching

During my graduate studies at McGill University I had the opportunity to teach three courses. In each case I was solely responsible for teaching the material, assigning homework, and setting the final examination. My students' course evaluations are available on request.

- **MATH 222: Calculus 3** (summer 2009)
A second year undergraduate class offered to science and engineering students.
Enrollment: 64 students
- **MATH 578: Numerical Analysis 1** (fall 2008)
A postgraduate class offered to MSc and PhD science and engineering students.
Enrollment: 4 students
- **COMP 350: Numerical Computing** (winter 2005)
A compulsory class for major and honours students in computer science.
Enrollment: 52 students

Teaching Assistantships

At the Univeristy of Oxford

During my stay in Oxford I held class tutorials (weekly problem-solving sessions for groups of 8 to 12 students) for the following undergraduate-level classes:

- **Part C Numerical Linear Algebra** (fall 2011)
- **Part A Numerical Analysis** (winter 2010)
- **Part C Numerical Linear Algebra** (fall 2010)

I also ran revision tutorials (personalized examination review sessions for small groups of 2 to 4 students) at Wadham College for Part A Numerical Analysis (summer 2011).

Finally, I helped grade various collections (mock examinations set by the colleges in preparation for the final examinations) for Wadham College and Sommerville College (summer 2011).

At McGill University

I was a teaching assistant for the following classes. My duties included grading assignments and examinations, as well as holding office hours to answer students' questions.

- **COMP 540: Matrix Computations** (2009)
- **COMP 540: Matrix Computations** (2008)
- **COMP 540: Matrix Computations** (2007)

Private Tutoring

I have given numerous private tutoring sessions in mathematics, physics, and computer science to students at McGill University and at the University of Oxford.

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Service

Reviewing

Acted as peer-reviewer for the following journals:

- Arab Journal of Mathematics and Mathematical Sciences
- Computer Physics Communications
- Computational Statistics and Data Analysis
- Journal of Computational Mathematics
- Linear Algebra and its Applications
- Numerical Algorithms
- Numerical Linear Algebra with Applications
- SIAM Journal on Matrix Analysis and Applications
- SIAM Journal on Scientific Computing

Memberships

Member of the following societies:

- International Linear Algebra Society (ILAS)
- Society for Industrial and Applied Mathematics (SIAM)
- SIAM Activity Group in Linear Algebra
- SIAM Activity Group in Optimization

Involvement

At the University of Oxford:

- MSc in Mathematical Modelling and Scientific Computing (2011)
 - Performed admissions interviews, in person and by phone.
 - Asked mathematics questions to the candidates and ranked them according to performance.
- Member of the Wadham College Middle Common Room (MCR) social club (2011)
- Member of the Wadham College inter-collegiate squash team (2010–2011)

At McGill University:

- School of Computer Science Graduate Studies Committee (2007–2009)
 - As student member, acted as a link between the committee and graduate students.
 - Contributed to reforms to the comprehensive examination taken by all PhD candidates.
- Member, School of Computer Science Graduate Students' Society (2007–2009)
 - Organized a bi-monthly graduate student seminar series.
 - Helped coordinate the School of Computer Science Alumni Open House fundraising event.
 - Started a School of Computer Science intramural ice-hockey team.
 - Organized and participated in several social activities for graduate students.
- Member of the University Squash Club and the Master's Swimming Club (2005–2009)