

John Drozd's Resumé

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Current Position:

I recently graduated with a Ph.D. in Applied Mathematics (Theoretical Physics) in May, 2009 at The University of Western Ontario in London, Ontario, Canada. My Ph.D. research involved developing a three-dimensional computer simulation of granular matter. I am now utilizing my programming and computational skills as well as my mathematical and physics background as a Post-Doctorate Fellow. I have a 2 year Post-Doctoral Fellowship working for Dr. Robert Bartha in the medical imaging department of [Robarts Research Institute](#) at The University of Western Ontario in London, Ontario, Canada. I wrote a proposal and I was awarded a 2 year Post-Doctoral Fellowship Research Grant from The Alzheimer Society. My research project entails developing fully automated algorithms and software for image processing of MRI images to measure volumetric changes in ventricles, the hippocampus and total intra-cranial brain volume. I am also developing software to measure and quantify amyloid plaques in brain tissue which is also an early sign of Alzheimer's disease. I am developing my code using C++, ITK and 3D Slicer. The goal of my research work aims to help detect the early onset of Alzheimer's Disease. My software is planned to be used in clinical studies.

Degrees

Ph.D. University of Western Ontario, Applied Mathematics, Theoretical Physics/Soft Matter and Materials Physics (Computational Materials Science), 2009

M.Sc. University of Western Ontario, Applied Mathematics, 2004

Diploma in Honors Standing, University of Western Ontario, Applied Mathematics and Computer Science, 2001

Bachelor of Technology, Ryerson University, Architectural Science, Project Management Option, 1989

University of Alberta, Mechanical Engineering Co-op, 1982-1985 (2 of 4 years completed)

Awards

- 1987 Ryerson Highest Grades in Project Management Award
- 1988,1989 Ryerson Dean's List Award
- 1999–2000 UWO Dean's List Award
- 2000 Third Year Applied Mathematics and Computer Science Award
- 2001 UWO President's Scholarship Award (declined because was awarded NSERC Scholarship)
- 2001 UWO Graduate Tuition Scholarship Award
- 2001 [Ontario Graduate Scholarship](#) Award (declined because was awarded NSERC Scholarship)
- 2001 [NSERC](#) PGSA Master's Scholarship Award
- 2003 [SHARCNET](#) Fellowship
- 2003 [Ontario Graduate Scholarship](#) Award (starting January 2004)
- 2004 [Ontario Graduate Scholarship](#) Award (starting January 2005)
- 2007 [Shell Sweeney Scholarship](#) Award
- 2008 Faculty of Science Graduate Student Teaching Award for the Department of Applied Mathematics
- 2009 Postdoctoral Fellowship Research Grant from [The Alzheimer Society](#)

Presentations

John J. Drozd and Colin Denniston, "[Constitutive relations in dense granular flows](#)" presented at the March 2009 American Physical Society conference in Pittsburgh, Pennsylvania, U.S.A., March 16–20, 2009.

["Velocity fluctuations in dense granular flow"](#) presented at the American Physical Society March meeting, New Orleans, Louisiana, U.S.A., March 10–14, 2008. (Supervisor: [Dr. Colin Denniston](#))

"Managing A Computer Simulation of Gravity Driven Granular Flow" presented at the University of Western Ontario, London, May 29, 2007 as part of the requirements of the Scientific Computing Seminar Course SC 501. (Supervisor: [Dr. Colin Denniston](#))

"Computer Simulation of Gravity–Driven Granular Flow" presented at the [Western Canadian Conference for Young Researchers in Mathematics 2007](#) at the [University of Calgary](#), Alberta, May 4–6, 2007. (Supervisor: [Dr. Colin Denniston](#))

["The Fluid–Glass Transition for Hard Spheres"](#) presented at the American Physical Society March meeting, Denver, Colorado, U.S.A., March 5–9, 2007. (Supervisor: [Dr. Colin Denniston](#))

["Collision Times and Stress Distributions in Mono and Polydisperse Granular Flows"](#) presented at

the American Physical Society March meeting, Baltimore, Maryland, U.S.A., March 13–17, 2006. (Supervisor: [Dr. Colin Denniston](#))

["Collision times and stress in gravity driven granular flow"](#) presented at the American Physical Society March meeting, Los Angeles, California, U.S.A., March 19–25, 2005. (Supervisor: [Dr. Colin Denniston](#))

"The Nonlinear Schroedinger Equation and Its Possible Applications" presentation at the [Canadian Association of Physicists](#) Congress, Quebec City, June 2–5, 2002. (Supervisor: [Dr. Sree Ram Valluri](#))

["Nuclear Matter as a Nonlinear Optical Medium and the Nonlinear Schroedinger Equation"](#) at the World Congress of Nonlinear Analysts (WCNA) 2000 conference held at Catania, Sicily, Italy, July 18–26, 2000. (Supervisor: [Dr. Sree Ram Valluri](#))

["The Apsidal Angle and its Derivative in Newton's Apsidal Precession Theorem"](#) poster presentation at the [Canadian Applied and Industrial Mathematics Society \(CAIMS\)](#) and Math 2000 conference held at McMaster University in Hamilton, Ontario, June 10–13, 2000. (Supervisor: [Dr. Sree Ram Valluri](#))

"A Pseudo-Spectral(Fourier) Method to Examine the Non-Linear Evolution of a $\tanh^3 y$ Mixing Layer" at the 19th Annual Meeting of the [Canadian Applied Mathematics Society](#) held jointly with the 13th Canadian Symposium on Fluid Dynamics at Vancouver, British Columbia in May 1998. (Supervisor: [Professor Roland Mallier](#))

"The Physics of Meteors" at the 1999 Canadian Undergraduate Physics Conference (CUPC '99) held at the [University of Alberta](#) in Edmonton.

Attended Conferences

Performed numerical computations to produce three dimensional plots for a poster on "The Fourier Transform of the Gravitational Wave Pulsar Signal" for the [4th Edoardo Amaldi Conference on Gravitational Waves](#), The University of Western Australia, Perth, Australia, July 8 – 13, 2001. (Supervisor: [Dr. Sree Ram Valluri](#))

Attended the [Society of Industrial and Applied Mathematics \(SIAM\)](#) 2000 Annual General Meeting Conference in Rio Grande, Puerto Rico, July 10–14, 2000.

Attended the "Asteroids, Comets, and Meteors 1999" conference at Cornell University in Ithaca,

New York State, with Western's [Meteor Physics Department](#) led by [Professor Jim Jones](#) for whom I worked as a scientific programmer and gui developer.

Upcoming Conferences

[American Physical Society March Meeting](#), Portland, Oregon, U.S.A., March 15–19, 2010.

[International Society for Magnetic Resonance in Medicine Annual Meeting](#), Stockholm, Sweden, May 1–7, 2010.

Publications

[The Linkage of Negotiating Skills to Successful Project Management Decision Making](#) Project Management Thesis (Ryerson University), 1989.

["Computer Simulation of Gravity-Driven Granular Flow"](#) Doctoral Thesis (University of Western Ontario), 2009.

["The Computer Simulation of Granular Matter: A Study of An Industrial Grinding Mill"](#) Master of Science Thesis (University of Western Ontario), 2004.

S. Saujani, J. Drozd and R. Mallier ["Nonlinear evolution of singular disturbances to a \$\tanh^3\$ mixing layer"](#), [Australian & New Zealand Industrial and Applied Mathematics Journal, Series B, ANZIAM J. 43\(2002\), 409–427](#) (published by the [Australian Mathematical Society](#)).

S R Valluri, J J Drozd, F A Chishtie, R G Biggs, M Davison, Sanjeev V Dhurandhar and B S Sathyaprakash ["A Study of the Gravitational Wave Form From Pulsars"](#), [Erratum Classical and Quantum Gravity](#), Proceedings of the 4th Edoardo Amaldi Conference on Gravitational Waves, Perth, Western Australia, 8–13 July 2001, Vol. 19 No. 7 (April 2002) 1327–1334, Erratum Vol. 19, 4227.

J. J. Drozd and C. Denniston, ["Simulations of collision times in gravity driven granular flow"](#) [Europhysics Letters](#), 76 (3), pp. 360–366 (November 2006). [cond-mat/0609330](#)

Oleh Baran, John J. Drozd, Robert J. Martinuzzi and Peter H. Poole, ["Granular circulation in a cylindrical pan: simulations of reversing radial and tangential flows"](#) [Physical Review E](#), 76, 021305 (2007) [cond-mat/0608072](#)

John J. Drozd and Colin Denniston, ["Velocity fluctuations in dense granular flows"](#) [Physical Review E](#), 78, 041304 (2008).

John J. Drozd and Colin Denniston, ["Constitutive relations in dense granular flows"](#) submitted to [Physical Review E](#).

Teaching Assistant (involved teaching tutorials and marking assignments/quizzes and midterms) for:

[Applied Math 376a\(3415b\)](#): Sept. – Dec. 2001 (Professor Gerry C. McKeon)

Applied Mathematics for Electrical Engineers

Description: Topics include: Introduction to complex analysis; complex integration; vector calculus including integral theorems; boundary value problems in cartesian coordinates; separation of variables; Fourier series and transform methods of solution.

[Applied Math 376a\(3415b\)](#): Sept. – Dec. 2002 (Professor Vladimir A. Miranskyy)

[Calculus 251b\(2503b\)](#): Jan. – Apr. 2004 (Professor Victor Elias)

Advanced Calculus II

Description: Integral calculus of functions of several variables: multiple integrals; Leibnitz' rule; arc length; surface area; Green's theorem; independence of path; simply connected and multiply connected domains; three dimensional theory and applications; divergence theorem; Stokes' theorem.

[Applied Math 275\(2413\)](#): Sept. – Dec. 2004 (Professor Khoa Nguyen)

Applied Mathematical and Numerical Methods for Mechanical Engineering

Description: Topics include: Introduction to Matlab; numerical differentiation and integration; numerical linear algebra; ordinary differential equations including higher order systems and numerical solutions; interpolation and approximation; multiple integrals and vector integral theorems.

[Calculus 050a\(1000a\)](#): Sept. – Dec. 2005 (Professor Sree Ram Valluri)

Calculus I

Description: Review of limits and derivatives of exponential, logarithmic and rational functions. Trigonometric functions and their inverses. The derivatives of the trig functions and their inverses. L'Hospital's rules. The definite integral. Fundamental theorem of Calculus. Simple substitution. Applications including areas of regions and volumes of solids of revolution.

[Applied Math 261b\(2813b\)](#): Jan. – Apr. 2006 (Professor Colin Denniston)

Numerical Analysis

Description: Introduction to numerical analysis; polynomial interpolation, numerical integration, matrix computations, linear systems, nonlinear equations and optimization, the initial value problem. Assignments using a computer and the software package, Matlab, are an important component of this course.

[Linear Algebra 040a\(1600a\)](#): Sept. – Dec. 2006 (Professors Sree Ram Valluri, Meera Mainkar and Gord Sinnamon). In particular, I managed the course grades and an incredible MatLab based lab web page that was created by [Professor Sinnamon](#). I coproctored Matlab based linear algebra quizzes held during computer labs. I also taught two linear algebra review lectures for Professor Mainkar on linear transformations, rotations, reflections, orthogonal projections, the geometry of linear operators, their composition and invertability, determinants, bases, subspaces, spans, and row, column and null spaces and kernels.

Linear Algebra I

Description: Properties and applications of vectors; matrix algebra; solving systems of linear equations; determinants; vector spaces; orthogonality; eigenvalues and eigenvectors.

[Calculus 051b\(1501b\)](#): Jan. – Apr. 2007 (Professor Carol Jones, including teaching lectures on “Rolle’s Theorem” and the “Mean Value Theorem”)

Calculus II for Mathematical and Physical Sciences

Description: Students who intend to pursue a degree in Actuarial Science, Applied Mathematics, Astronomy, Mathematics, Physics, or Statistics should take this course. Techniques of integration; The Mean Value Theorem and its consequences; series, Taylor series with applications; parametric and polar curves with applications; first order linear and separable differential equations with applications.

[Applied Math 026\(1413\)](#): Sept. – Dec. 2007 (Professor Bogdan Tudose)

Applied Mathematics for Engineers I

Description: The calculus of functions of one and more variables with emphasis on applications in Engineering Science. For students in Engineering Science only.

[Calculus 081b\(1301b\)](#): Jan. – Apr. 2008 (Professor Rasul Shafikov)

Prepared review and summary notes as handouts and lectured 1 week of review classes for [Applied Math 277\(2411\)](#) for Professor Henning Rasmussen: 2004

Applied Mathematics for Engineering II

Description: This course is intended to be taken by Chemical and Civil Engineering students. Topics include ordinary differential equations, Laplace transforms, multiple integrals, introduction to partial differential equations, and Fourier Series.

Tutored for:

[Calculus 051b\(1501b\)](#)

[Applied Math 026\(1413\)](#)

[Applied Math 275\(2413\)](#)

[Applied Math 277\(2411\)](#) This engineering student needed above 70% to stay in engineering, and he achieved it.

[Applied Math 375a\(3413a\)](#)

Applied Mathematics for Mechanical Engineers

Description: Topics include: Fourier series, integrals and transforms; boundary value problems in cartesian coordinates; separation of variables; Fourier and Laplace methods of solution.

Note: All students that I have tutored have passed their course.

Work Experience

2009–Present Post–Doctoral Fellow at the University of Western Ontario, Robarts Research Institute in London, Ontario.

2004–2009 Applied Mathematics (Theoretical Physics) Doctoral Student The University of Western Ontario, London, Ontario.

2001–2004 Applied Mathematics Master of Science Student at The University of Western Ontario, London, Ontario.

1996–2001 Applied Mathematics and Computer Science Undergraduate Student at The University of

Western Ontario, London, Ontario.

June 94 - July 94: Project Coordinator, Realspace Management, Markham

-Coordinating renovations to IBM Headquarters in Markham.

April 92 - November 93: Cost Estimator and Project Coordinator, Tactix Construction, Toronto

-Compiling project costs and preparing detailed quantity takeoffs and cost estimates for bidding projects out for tender.

-Coordinating, reviewing and processing shop drawings, change notices and change orders, expediting quotations and purchase orders for commercial and residential projects.

May 89 - March 92: Project Coordinator of \$64.5 Million construction:

-Caisson foundations, structural steel, reinforced concrete, architectural finishes, curtainwall, skylights, roofing, conveyors, mechanical and electrical installations.

EllisDon, Air Canada Terminal 2 Redevelopment, L.B.P.I.A.

-Assisting Site Superintendents in construction supervision by writing detailed letters clarifying construction details to subtrades prior to construction and assisting foremen by providing them up to date drawings and construction details.

-Expediting, reviewing, and coordinating approvals of shop drawings, samples and contract documents with Architects and Consultants.

-Working with IBM PC Computer utilizing "Expedition" construction document control and "Lotus" spreadsheet software.

-Expediting material deliveries, distributing and preparing contract tender packages with assistant Project Manager, preparing estimates, and change notices.

-Resolving design problems prior to construction (e.g. designing steel platform with engineer and structural steel foreman for supporting mechanical equipment, designing lintel and masonry wall opening for mechanical louver, informing project manager that glass for skylight has to be resized because size of structural opening in roof was revised, informing Architect that a column that the Architect thought existed was not existent and that a new column must be designed, informing Architect that a mid-height structural steel girt must be designed to support revised cladding design), arranging a meeting with toilet partition supplier and manufacturer and proving with my file copy of the approved shop drawing that the supplier made a mistake in providing toilet partitions with the wrong finish and colour which resulted in the toilet partition supplier refinishing the toilet partitions at his expense, coordinating recesses for washroom accessories and ordering appropriate stainless steel skirts and frames, coordinating undercuts of doors and heights of curved tempered glass/stainless steel concession partitions with floor finish heights, obtaining as built conveyor and airport drawings from Transport and Air Canada staff, preparing an all inclusive colour and finishing schedule for Air Canada, drafting design sketches, compiling takeoffs and estimates, drafting and preparing as built drawings and compiling warranties and maintenance manuals, arranging for subtrades to give cleaning demonstrations for airport staff.

May 88 - August 88: Site Clerk and Assistant Field Engineer, EllisDon, Freeport Hospital Project, Kitchener

1985–1989 Architectural Science (Project Management) Undergraduate Student at Ryerson University, Toronto, Ontario.

May 83 - August 85: Co-op Student Mechanical Engineer, Millwright Apprentice and Shift Operator, [Syn crude Canada Ltd.](#) , Fort McMurray, Alberta.

1982–1985 Mechanical Engineering Coop Undergraduate Student at the University of Alberta, Edmonton, Alberta. (2 of 4 years completed)

Professional Affiliations:

Past Executive Secretary for the Toronto Chapter of the [American Institute of Constructors](#)

Past Member of the [Association of Architectural Technologists of Ontario](#)

Member of the [Canadian Applied and Industrial Mathematics Society](#)

Member of the [Society of Industrial and Applied Mathematics](#)

Member of the [Canadian Association of Physicists](#)

Member of the [American Physical Society](#)

Member of the student organized [Theoretical Physics Grad Colloquium](#)

Member of stock trading organization [Better Trades](#)

Academic Experience:

Summer 1997 and 1998, wrote manual on [Form](#) and performed integral evaluations using [Maple V](#) for [Professor Roger Migneron](#).

Fall/Winter 1998, wrote program to generate [Applied Math Coffee Mug logo](#) using [Matlab](#). The [logo](#) is a conformal plot of the Lambert–W Function that was created for a [Lambert–W Function](#) Poster Project for [Professor Robert Corless](#). Professor Corless drives around with “WFUN!” on his license plate!

Summer 1999, wrote scientific software for radar echo analysis of [meteor showers](#) and developed graphical user interfaces for [Professor Jim Jones](#).

Summer 2000, wrote financial mathematics software (stock volatility analysis) for [Professor Henning Rasmussen](#). Worked on computer simulation of granular materials for [Professor Peter Poole](#). Revised meteor physics software for [Professor Jim Jones](#).

Volunteer Experience:

2002–present volunteer for [Knights of Columbus](#) (sell car raffle tickets for arthritis society, buy and deliver toys and food hampers to needy families during Christmas, usher at church, porter senior citizens in wheelchairs from their residence to Sunday mass at [Mount Hope](#)). Serve the role of lecturer on our [Knights of Columbus Council 10561](#) St. Pius X (Holy Family Parish) Executive Committee, organizing guest speakers of various charities to give talks to our council to which Knights of Columbus funds donations. Past speakers have been from [Hospice of London](#), the [Canadian Aid for Southern Sudan \(CASS\)](#), [L'Arche London](#), [Mount Hope](#), [London Abused Women's Centre](#), [London Area Right To Life](#), Family Life and Youth Ministry at my church [Holy Family Parish](#), [Down Syndrome Research Institute](#), [Special Olympics Ontario / London](#) and [Bethanys Hope Foundation](#).

1994, volunteered as dunk tank dunkie to raise funds for community swimming pool in my neighborhood.

1994, volunteered for [Oxfam International](#).

1994, volunteered for [S.A.R.I. Special Ability Riding Institute](#), grooming horses and leading handicapped children on horses.

Fraternity:

Third Degree Member of the [Knights of Columbus](#). <http://www.kofc10561.com/>
