Daniel W. Zaide, P. Eng.

CONTACT INFORMATION

Department of Mechanical Engineering
University of British Columbia
2054-6250 Applied Science Lane
Vancouver, BC, V6T 1Z4
www.mech.ubc.ca

Home: 1991 East 4^{th} Avenue
Vancouver, BC, V5N 1K3
Cell: (604) 358-6056
E-mail: dan.zaide@gmail.com
website: www.danielzaide.com

CITIZENSHIP

Canada

EDUCATION

University of Michigan, Ann Arbor, Michigan, USA

Ph.D., Aerospace Engineering and Scientific Computing, June 2012

- Advisors: Professor Philip L. Roe and Professor Kenneth G. Powell
- Dissertation: *Numerical Shockwave Anomalies*
- Areas of Study: Computational Fluid Dynamics, Shockwaves
- Member of the Center for Radiative Shock Hydrodynamics
- Courses Include: High-Energy-Density Physics, Algorithms, Uncertainty Quantification

M.S., Applied Mathematics, April 2011

- Courses Include: Complex Variables, Numerical Methods for Scientific Computing I & II, Introduction to Partial Differential Equations, Combinatorics and Graph Theory, Linear Systems and Matrix Theory, Advanced Calculus II

M.S.E., Aerospace Engineering, April 2009

- Courses Include: Viscous Flows, Compressible Flow, Computational Fluid Dynamics I & II, Molecular Gas Dynamics, Introduction to Turbulence, Combustion Processes, Advanced Aerodynamics

University of Toronto, Toronto, Ontario, Canada

B.A.Sc. with Honours, Engineering Science, June 2007

- Advisor: Professor David W. Zingg
- Aerospace Engineering Specialization

PROFESSIONAL DEVELOPMENT

Instructional Skills Workshop, Certificate of Completion, December 2012
Applications of Parallel Computers, Certificate of Completion, May 2013
Foundations of Project Management I, Certificate of Completion, May 2013

AWARDS

20th AIAA CFD Conference, 4th AIAA CFD Student Paper Competition

- 1^{st} Place, "Shock Capturing Anomalies and the Jump Conditions in One Dimension", June 2011

Natural Sciences and Engineering Research Council of Canada

- Postgraduate Doctoral Scholarship (PGS-D), 2010-2013

Rackham Graduate School, University of Michigan

- Rackham Travel Grant, 2009, 2010, 2011

Department of Aerospace Engineering, University of Michigan

- Mr. & Mrs. Oliphant Fellowship, 2007

Natural Sciences and Engineering Research Council of Canada
- Undergraduate Student Research Award, 2006

Experience

Desktop Aeronautics, Palo Alto, CA

Contract Worker **February 2014 - Present**

- Developing tutorials and lesson plans to introduce commercial software into existing university curriculum utilizing the flipped classroom paradigm.
- Developing company plan for instructional material for training existing and new customers to efficiently use their software.

Department of Mechanical Engineering, University of British Columbia

Post-Doctoral Fellow **Sept. 2012 - Present**

- Researching in the Advanced Numerical Simulation Lab under the supervision of Dr. Carl Ollivier-Gooch, developing software for unstructured mesh adaptation in the simulation of semiconductor device fabrication and operation.

Department of Mechanical Engineering, University of British Columbia

Sessional Lecturer, Undergraduate Aerodynamics **January 2013 to April 2013**

- Developed course notes and supplementary resources for the undergraduate aerodynamics course to senior engineering students. Lectured, graded, and administered course material.

Department of Aerospace Engineering, University of Michigan

Graduate Student Instructor **Fall 2011**

- Teaching Assistant for AERO 520: Compressible Flow
  - Responsible for holding office hours, answering questions about course material, and assisting with homework material.
  - Developed homework and midterm solutions and grading rubrics.
  - Graded midterms, homework, and course project.

Department of Aerospace Engineering, University of Michigan

Graduate Student Instructor **Fall 2010**

- Teaching Assistant for AERO 523: Computational Fluid Dynamics I
  - Responsible for holding regular office hours and answering questions about course material.
  - Verified integrity of homework assignments by creating solution keys and providing students with working code when required.
  - Developed grading rubrics and supervised grading of assignments.

Los Alamos National Laboratory, Los Alamos, New Mexico, USA

Graduate Student Researcher **May 2010 to August 2010**

- Examined the numerical wall heating phenomenon and implemented implicit-explicit methods for radiation hydrodynamics under Dr. Robert B. Lowrie.

Center for Radiative Shock Hydrodynamics, University of Michigan

Graduate Student Research Assistant **2009-2012**

- Collaborated with a large research team on numerical method development, simulation and uncertainty quantification of large scale radiative shockwave experiments.

Department of Physics, University of Cambridge, Cambridge, UK

Visiting Student **May 2009 to July 2009**

- Investigated new approaches for Lagrangian methods for fluid flows under Professor Nikos Nikiforakis and visiting fellow Philip L. Roe in collaboration with Dr. Andrew Barlow, Atomic Weapons Establishment (AWE).

Department of Aerospace Engineering, University of Michigan

Graduate Student Instructor **Fall 2007, Winter 2008, Fall 2010, Winter 2011**

- Teaching Assistant for AERO 325: Introduction to Aerodynamics
  - Responsible for holding regular office hours and answering questions about course material.
  - Gave occasional lectures on course material and other related topics.

Department of Mechanical Engineering, University of British Columbia

Undergraduate Researcher **Summers 2002, 2003**

- Worked in the Advanced Numerical Simulation Lab under the supervision of Dr. Carl Ollivier-Gooch.
- Examined feasibility of shock-fitting within unstructured grid Finite Volume framework under existing code structure and capability.
- Expanded existing unit testing for Dr. Ollivier-Gooch's generalized meshing library for the Interoperable Technologies for Advanced Petascale Simulations (ITAPS) Center.

Belcor Industries Inc., Richmond, BC.

Junior Engineer **June - August, 2002-2005**

- Developed Visual Basic .NET plug-ins for Solidworks 2005 which resulted in improved and streamlined production and facilitated Solidworks Model Database restructuring
- Collected, analyzed, and modeled CNC vises, clamps, and fixtures in Solidworks which helped expand the CNC model database.
- Edited and refined technical reports which improved communication between upper and lower management.

Conference Proceedings

Zaide, Daniel W. and Ollivier-Gooch, Carl F., **Inserting a Curve into a Mesh in Two Dimensions.** *22nd International Meshing Roundtable*, Oct 2013.

Zaide, Daniel W. and Roe, Philip L.,**A Second-Order Finite Volume Method that Reduces Numerical Shockwave Anomalies in One Dimension.** *21st AIAA Computational Fluid Dynamics Conference*, June 2013, AIAA-2013-2699

Zaide, Daniel W. and Roe, Philip L., **Flux Functions for Reducing Numerical Shockwave Anomalies**. *Seventh International Conference on Computational Fluid Dynamics*, July 2012

Zaide, Daniel W. and Roe, Philip L., **Shock Capturing Anomalies and the Jump Conditions in One Dimension.** *20th AIAA Computational Fluid Dynamics Conference*, June 2011, AIAA-2011-3686

Roe, Philip L. and Zaide, Daniel W., **Entropy Traces in Eulerian and Lagrangian Calculations.** *Sixth International Conference on Computational Fluid Dynamics*, July 2010

Zaide, Daniel W. and Roe, Philip L., **Entropy-based Mesh Refinement, II: A New Approach to Mesh Movement.** *19th AIAA Computational Fluid Dynamics Conference*, June 2009, AIAA-2009-3791

Conference Presentations

Zaide, Daniel W., **Why do Numerical Shockwaves Jump to the Wrong Conclusions**. Presentation *Canadian Applied and Industrial Mathematics Society Conference*, June 2013

Zaide, Daniel W., **How to Capture a Shockwave**. Presentation *Future Directions in CFD Research, A Modeling and Simulation Conference*, August 2012

Roe, Philip L., and Zaide, Daniel W., **Ameliorating Shock-capturing Anomalies**. *14th International Conference on Hyperbolic Problems: Theory, Numerics, Applications*, June 2012

Roe, Philip L., and Zaide, Daniel W., **Removing Shock-capturing Anomalies**. *The 9th New Models and Hydrocodes for Shock Wave Processes Conference*, April 2012

Zaide, Daniel W. and Roe, Philip L., **Shock Capturing Anomalies and the Jump Conditions in One Dimension.** Poster. *53rd Annual Meeting of the APS Division of Plasma Physics*, November 2011

Zaide, Daniel W. and Roe, Philip L., **On Wall Heating, Slowly Moving Shocks, and Sub-cell Shock Position.** *International Conference on Numerical Methods For Multi-Material Fluid Flows*, September 2011

Zaide, Daniel W. and Lowrie, Robert B., **A Second-Order IMEX Method for Radiation Hydrodynamics.** *7th International Congress on Industrial and Applied Mathematics*, July 2011

Moran-Lopez, J. Tiberius, Zaide, Daniel W., Holloway, James P., and Schilling, Oleg., **Effects of Turbulence on Taylor-Sedov Blast Waves in Radially-Symmetric Geometries.** *62nd Annual Meeting of the APS Division of Fluid Dynamics*, November 2009.

Roe, Philip L. and Zaide, Daniel W., **An Eulerian Look at Lagrangian CFD.** *Numerical Methods for Multi-material Fluids and Structures Conference*, September 2009

Seminars

Why do Numerical Shockwaves Jump to the Wrong Conclusions?

- Iowa State Oct 2011
- Simon Fraser University, Oct 2013
- University of British Columbia, Nov 2013

Other Contributions

Zaide, Daniel W., and Lowrie, Robert B., An IMEX Method for Radiation Hydrodynamics. Poster. October 2010.

Zaide, Daniel W., Roe, and Philip L., Entropy Traces in Lagrangian and Eulerian Calculations. Poster. University of Michigan Engineering Graduate Symposium. October 2010.

Zaide, Daniel W., Roe, Philip L., and Powell, Kenneth G., Investigating the Wall Heating Phenomenon. Poster. September 2009.

Zaide, Daniel W., Roe, Philip L. On Godunov-Type Lagrangian Methods. Poster. September 2009

Moran-Lopez, J. Tiberius, Zaide, Daniel W., Holloway, James P. , and Schilling, Oleg. Towards a Self-Similar Analysis of the Turbulent Taylor-Sedov Blast Wave. Poster. September 2009

Zaide, Daniel W., Moran-Lopez, J. Tiberius, Fidkowski, Krzyzstof J., and Powell, Kenneth G. Fully-Implicit Discontinuous Galerkin Methods for Hydro-P1 Equations. Poster. April 2009

Moran-Lopez, J. Tiberius, Holloway, James P., Zaide, Daniel W., Schilling, Oleg. Turbulent Radiative Shock Modeling with Low-Order Angular Moment Resolution. Poster. April 2009

Zaide, Daniel W., High-Order Finite-Difference Methods for the Quasi-1D Euler Equations. Undergraduate Thesis. April 2007

Professional Service

Team Mentor - Simon Fraser University Unmanned Aerial Vehicle Team
Co-Faculty Advisor - University of British Columbia Human Powered Vehicle Team

Technical Skills

Programming: C, C++, Python, Matlab
Word Processing Software: TEX, LATEX, Microsoft Office, Open Office
Technical Software: Matlab, Mathematica, Octave, Paraview
Operating Systems: Microsoft Windows, Linux, OS X