

Adam O'Brien

Curriculum Vitae

PERSONAL DETAILS

Birth January 23, 1989
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EDUCATION

PhD. Mechanical and Industrial Engineering

2014-Present

University of Toronto

Thesis Topic is the numerical simulation of particle clusters at multi-phase fluid interfaces. Applications are being developed as part of the widely used open source CFD project OpenFOAM, written in C++, which allow for clusters of particles to be solved modelled as immersed boundaries.

MASc. Aerospace Engineering

2012-2014

University of Toronto Institute for Aerospace Studies

Thesis topic is the numerical simulation of the thermoacoustic response of laboratory-scale premixed multi-slit burner flames. The in house code CFFC was used, which utilizes a fully implicit adaptive-mesh refinement scheme for solving combustion problems.

BEng. Mechanical and Aerospace Engineering

2008-2012

Carleton University

Specialization in aerodynamics and propulsion. Achieved a 10.96/12.00 GPA, and was a Dean's List student in all four years.

TEACHING EXPERIENCE

Teaching Assistant

2011-2012

Carleton University Department of Mechanical and Aerospace Engineering

Teaching assistant for the course Introduction to Engineering (ECOR1000). Weekly responsibilities included leading one three hour tutorial every week, assisting with another, holding office hours and marking assignments. Students made heavy use of MATLAB and also some introductory C++.

Peer Assisted Study Sessions (PASS) Facilitator

2010-2012

Carleton University Student Academic Success Center

Weekly responsibilities included designing and organizing two academic workshops every week for students taking Thermodynamics and Heat Transfer (MAAE2400) and holding office hours. Teaching skills are strongly coveted in the PASS program, and several workshops for effective teaching methods were attended.

SKILLS

<i>Programming</i>	C++ (Fluent)
	C (Fluent)
	Fortran (Strong working proficiency)
	Shell Script (Strong working proficiency)
	Java (Working proficiency)
<i>Software</i>	MATLAB, L ^A T _E X, ANSYS, OPENFOAM, TECPLOT, WORD, EXCEL

PROJECTS

N-body Interaction Solver 2014-Present

Personal Project

Development of a fully parallel N-body solver for gravitational N-body problems and smoothed-particle hydrodynamics in C++. N-body interactions are resolved using a Barnes-Hut tree algorithm, and second-order Leap-Frog or Verlet explicit time-marching is used.

2-D Compressible Navier-Stokes Solver 2013-Present

Personal Project

Development of a fully-compressible, fully-parallel Navier-Stokes solver in C++, which currently utilizes a third-order MUSCL spatial reconstruction scheme and fourth-order Runge-Kutta explicit time-marching.

2-D Incompressible Navier-Stokes Solver 2012

NSERC Project

Completed as part of the NSERC Undergraduate Researcher program, this C++ code solves the incompressible Navier-Stokes equations using the SIMPLER and SIMPLEC algorithms.

2-D Unsteady Vortex-Panel Method Solver 2012

NSERC Project

Completed as part of the NSERC Undergraduate Researcher program, this C++ code solves incompressible, irrotational flow around arbitrarily shaped airfoils. Unsteady effects are captured using the wake-particle circulation perserving scheme.

AWARDS

University of Toronto Academic Scholarship 2014

University of Toronto

Ontario Graduate Scholarship 2012-2013

Government of Ontario

NSERC Undergraduate Research Award 2012

National Sciences and Engineering Council

NSERC Undergraduate Research Award 2011

National Sciences and Engineering Council

Carleton University Academic Scholarship 2008-2012

Carleton University

REFERENCES

Available upon request