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| Contact Information | malcolmiwroberts@gmail.com malcolmiwroberts.com | |
| Education | BSc Honors Applied Mathematics MSc in Applied Mathematics PhD in Applied Mathematics | University of Alberta , 2001 University of Alberta , 2006 University of Alberta , 2011 |
| Work History | Postdoctoral Researcher, IRMA , Université de Strasbourg, France, since 2014. <ul style="list-style-type: none"> • Implement a discontinuous Galerkin solver in OpenCL to numerically solve general hyperbolic conservation laws using CPUs, GPUs, and MICs. • Present at conferences and publish articles in peer-reviewed journals. Postdoctoral Researcher, M2P2 , Aix-Marseille University, France, 2012 to 2014. <ul style="list-style-type: none"> • Design software for simulating magneto-hydrodynamic turbulence in a grid computing environment using spectral methods and penalisation. • Present at conferences and publish articles in peer-reviewed journals. Sessional Lecturer, University of Alberta , Canada, 2010. <ul style="list-style-type: none"> • Lectured differential equations in a team-teaching environment. Graduate Student, University of Alberta , Canada, 2003 to 2011. <ul style="list-style-type: none"> • Develop a coherent research program in applied mathematics. • Present at conferences and publish articles in peer-reviewed journals. • Run undergraduate math labs and help sessions. Undergraduate Researcher, University of Alberta , 1998 to 2000. | |
| Selected Projects | fftw++ (fftwpp.sf.net). <ul style="list-style-type: none"> • Implementation of implicitly dealiased convolutions: <ul style="list-style-type: none"> – Twice as fast and uses half the memory of other techniques. – Applications to image processing, machine learning, simulations. • MPI/OpenMP implementation of FFTs and convolutions for grid computing. • Resulted in 5 publications and several conference presentations so far. • Over 11 000 downloads. schnaps (schnaps.gforge.inria.fr). <ul style="list-style-type: none"> • A discontinuous-Galerkin solver for general numerical simulations. • Written in C and OpenCL. Runs on CPUs, GPUs, and MICs. • Resulted in 1 publication and several conference presentations so far. Subgrid models for turbulence. <ul style="list-style-type: none"> • Numerical technique for simulating fluid flows. • Drastically reduced computational cost. • Subject of my doctoral and masters dissertations. | |
| Skills | Collaboration and project management. Expertise in mathematical modelling and high-performance computing. Knowledge of dynamical systems, numerical methods, and statistics. I program in C++, C, OpenCL , Python, and FORTRAN, using OpenMP and MPI. Linux scripting, version control, grid computing environments. Data analysis and visualization: \LaTeX , Asymptote , and Paraview. Public speaking and scientific writing. Proficient in English and French. | |