John Wong

Curriculum Vitae

Email: anotherJohnWong@gmail.com
Other links: LinkedIn, Github

Experience

2014 – present
Software Engineer at The Weather Company, an IBM Business
Develop, maintain, architect WSI Pilotbrief Optima for the iPad, the most deployed aviation weather app in commercial aviation. Substantially improved users satisfaction by stabilizing and re-architected legacy codebase. Interfaced directly with beta testers and handled logistics related to pre-release programs.

2013 – 2014
Founder and developer at Metfolio, LLC
Metfolio is a start-up endeavor I bootstrapped on October 24, 2013, founded on the idea of discovering unexplored values in professional and research weather products by consumers. An aviation weather app, Nimbus, was briefly released in March, 2014 as the initial testing ground.

2009 – 2013
Graduate research/teaching assistant at Univ. of Colorado
Perform research under the primary guidance of Dr. Mary Barth at the National Center of Atmospheric Research (NCAR) and perform teaching duties when needed for the Department of Atmospheric and Oceanic Science.

2007 – 2008
Technical assistant at Univ. of Arkansas
Debugged and optimized existing Matlab programs for analyzing signals from solid state nanopore device.

Education

2010 – 2013
Ph.D., Atmospheric and Oceanic Sciences
University of Colorado at Boulder
Advisors: Dr. Mary Barth (NCAR/ACD), Dr. David Noone (CU)
Dissertation: Upper Tropospheric Ozone Enhancement during the North American Monsoon Evaluated using WRF-Chem
Defense date: August 23, 2013

2008– 2010
M.S., Atmospheric and Oceanic Sciences
University of Colorado at Boulder
Advisor: Dr. David Noone

2006 – 2007 **M.A., Physics**
University of Arkansas, Fayetteville
Advisor: Dr. John Stewart
Masters Thesis: Web-based Application for Automated Generation of Physics Concept Inventory

2003 – 2006 **B.S.** *magna cum laude*, **Physics** (Computational track)
University of Arkansas, Fayetteville
Advisor: Dr. Jiali Li
Thesis: DNA Detection with a Nanopore Device

2003 – 2006 **B.S.** *magna cum laude*, **Mathematics** (Applied track)
University of Arkansas, Fayetteville
Thesis: Chromatic Polynomial of Torus Networks

2003 – 2006 (minor) **Computer Sci and Computer Engineering**
University of Arkansas, Fayetteville

Projects

2014 – present **WSI Pilotbrief Optima for the iPad**
The leading aviation weather app deployed by commercial aviation. Delivers superior weather information, compiled text briefing, navigation information and flight plan overlay, inflight weather data streaming, and much more.

2013 – 2014 **Nimbus — An Aviation weather app**
Nimbus is an aviation weather app designed for the iPhone. It was released in March 2013 on the iTunes App Store and features a novel time-varying map-based graphical TAF interface. It was removed from the App Store at the beginning of the my career at WSI.

2012 – 2013 **Nested Regional Climate Model (NRCM)**
Assisting in a project at the National Center for Atmospheric Research (NCAR) to test and develop the regional chemistry module for a next-generation climate model across scales as well as utilizing climatological simulations to evaluate future pollution scenarios.

2010 – 2012 **Lightning parameterization at the convective scale**
As part of my ongoing research work with budgeting upper tropospheric summertime ozone enhancement, I have implemented a lightning parameterization module for WRF-Cem that is suitable for models running at resolutions that are transitional between fully-resolved and fully-parameterized convection.

2010 **Chemical kinetics with OpenCL**
For the class project of High Performance Scientific Computing at the University of Colorado at Boulder, I produced a version of the Regional Acid Deposition Model version 2 with Rosenbrock integration method using OpenCL. The same (identical) kernel has been tested and successfully ran on various CPUs and GPUs on platforms running Mac OS X 10.6.

2008 – 2013 **Convective-scale transport of trace gases assessed with models and satellite observations**
A collaboration between multiple scientists from NCAR, CU-Boulder, NOAA, and NASA JPL to quantify the contribution of North American summer-time convective transport to the distribution of ozone and carbon monoxide in the upper troposphere using both regional atmospheric chemistry models and satellite observations.

Sourcecode contributions

Lightning NOx driver
in *WRF-Chem v3.5*
Refactored old implementation of lightning nitrous oxides (NOx) emission module of WRF-Chem into two separate modules, each separately handle flash rate prediction and NOx emission respectively. Also mediate concurrent contribution from scientists from Florida State University.

Lightning-generated NOx for convective parameterized models
in *WRF-Chem v3.4*
Implemented lightning NOx emission option into WRF-Chem for convective parameterized scale simulations based on Price and Rind (J. Geophys. Res., 1992) parameterization and Ott et al (J. Geophys. Res., 2010) emission guidelines.

Online tendency diagnostics
in *WRF-Chem v3.2*
Developed module for decoupling tendency diagnostics for chemical species and producing accumulated diagnostic outputs.

Technical Skills

Techniques: Machine learning, heuristic optimization, heterogenous architecture
Languages: Python, Objective-C, Swift, C/C++, Java, Fortran, Javascript, *NIX scripting
Frameworks and libraries: OpenCL, MPI, OpenMP, SciPy, Scikit-learn
IDEs and tools: vi(m), Xcode, Instruments, Eclipse; Git; IDL, Matlab, Octave
Data and DBs: NetCDF, HDF5, GTFS; SQLs, exposure to MongoDB, Cassandra
Miscelleneous: LaTeX; exposure to Hadoop/YARN, AWS; Aviation (student pilot)

Publications

Pfister, G., S. Walters, J.-F. Lamarque, J. Fast, M. Barth, **J. Wong**, J. Done, G. Holland, C. Bruyere (2014). Projections of Future Summertime Ozone over the U.S. J. Geophys. Res. doi:10.1002/2013JD020932.

Wong, J., M. C. Barth, and D. Noone (2013). Evaluating a lightning parameterization based on cloud-top height for mesoscale numerical model simulations, Geosci. Model Dev., 6, 429-443, doi:10.5194/gmd-6-429-2013.

Noone. D., C. Risi, A. Bailey, M. Berkelhammer, D. P. Brown, N. Buenning, S. Gregory, J. Nusbaume, D. Schneider, J. Sykes, B. Vanderwende, **J. Wong**, Y. Meiller, and D. Wolfe (2013). Determining water sources in the boundary layer from tall tower profiles of water vapor and surface water isotope ratios after a snowstorm in Colorado. Atmos. Chem. Phys., 13, 1607–1623, doi:10.5194/acp-13-1607-2013.

Barth., M.C. , J. Lee, A. Hodzic, G. Pfister, W. C. Skamarock, J. Worden, **J. Wong**, and D. Noone (2012). Thunderstorms and upper tropospheric chemistry during the early stages of the 2006 North American Monsoon. Atmos. Chem. Phys., 12, 11003-11026, doi:10.5194/acp-12-11003-2012.

Selected Oral Presentations

Wong, J., M. Barth, and D. Noone. Lightning NOx parameterization in WRF-Chem with emphasis on validation. Invited talk at WRF-Chem Group Meeting, August 23, 2012; Boulder, CO.

Wong, J. From gaming to scientific computing: An introduction to General Purpose programming with GPUs (GPGPU). Presentation at Department of Atmospheric and Oceanic Science student forum, February 16, 2011; Boulder, CO.

Wong, J., D. Noone, M. C. Barth, W. Skamarock, G. Grell, and J. Worden. Budget and structural properties of the UTLS ozone enhancement during North American monsoon. Invited talk at WRF-Chem Group Meeting, October 27, 2010; Boulder, CO.

Selected Poster Presentations

Bela, M., M. Barth, **J. Wong**, O. Toon, H. Morrison, M. Weisman, K. Manning, G. Romine, W. Wang, K. Cummings, K. Pickering, and the DC3 Science Team. (2013) Evaluation of Wet Scavenging for the May 29, 2012 DC3 Severe Storm Case. 14th Annual WRF Workshop; 2013 Jun 24 – 29; Boulder, CO.

Wong, J., M. Barth, and D. Noone. (2012) Parameterizing Lightning-Generated NOx at resolutions with Convective Parameterization for Upper Tropospheric Ozone Simulations. 12th Annual WRF Users' Workshop; 2012 Jun 26 – 29; Boulder, CO.

Wong, J., M. Barth, and D. Noone. (2011) Lightning NOx Parameterization for Synoptic Meteorological-scale Predictions with Convective Parameterization in WRF-Chem. American Geophysical Union Fall meeting; 2011 Dec 5–9; San Francisco, CA.

Noone, D., C. Risi, A. Bailey, D. Brown, N. Buenning, S. Gregory, J. Nusbaumer, J. Sykes, D. Schneider, B. Vanderwende, **J. Wong**, D. Wolfe. (2010) Atmosphere-surface water exchanges from measurements of isotopic composition at a tall tower in Boulder. American Geophysical Union Fall Meeting; 2010 Dec 13–17; San Francisco, CA.

Wong, J., D. Noone, M. C. Barth, W. Skamarock, G. Grell, and J. Worden. (2009) A budget of the summertime ozone anomaly of 2006 above southern United States using WRF-Chem. American Geophysical Union Fall Meeting; 2009 Dec 14–18; San Francisco, CA.

Wong, J., D. Noone, M. C. Barth, W. Skamarock, G. Grell, and J. Worden. (2008) Coarse-scale convective transport of CO and O_3 over 36 hours above southern United States. American Geophysical Union Fall Meeting; 2008 Dec 15–19; San Francisco, CA.

Upperlevel Courseworks

Computer Science
High Performance Scientific Computing, Artificial Intelligence, Database Management Systems, Discrete Optimization, Formal Languages and Computability, Graph and Combinatorial Algorithms

Mathematics
Genetic Algorithms, Numerical Linear Algebra, Nonlinear Partial Differential Equations, Stochastic Processes, Game Theory

Physics
Fluid Instability & Turbulence, Mathematical Methods in Electromagnetic Theory, Thermal Physics, Quantum Mechanics, Applied Group Theory in Physics

Atmospheric Science
Numerical Weather Prediction, Atmospheric Chemistry, Atmospheric Dynamics, Physical Oceanography, Radiative Transfer & Remote Sensing, Clouds & Aerosols