SVETLANA TKACHENKO

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SUMMARY

· PhD in Mechanical Engineering, UNSW, 2018.Showed how wall radiation can boost PV facade output by up to 10%.
· Experienced with collocated interpolation and radiation-convection coupling in an in-house Fortran code.
· Showed sensitivity of turbulent flow in a differentially heated cavity to heat loss in the boundaries.
· Used ANSYS CFX, Fluent and a Fortran finite-volume solver for modelling turbulent flow via LES and k-ϵ models.
· Familiar with MATLAB for scientific computing, UNIX C and Objective C for desktop, also C++ and Qt.
· Experienced user of high-performance computing facilities Raijin NCI, as well as Trentino and CFD-Post at UNSW.
· Post-graduate experience with building ventilation, aerodynamics, and climate model post-processing at UNSW.

EDUCATION

PhD in Mechanical Engineering 2013 - 2018
University of New South Wales *Sydney, NSW, Australia*
· recipient of Australian Postgraduate Award (APA) scholarship
· coursework: MECH4620 Computational Fluid Dynamics, High Distinction

Bachelor (Honours) of Engineering and Technology with Distinction 2007 - 2012
Dubna International University of Nature, Society and Man, Russia *Moscow Oblast, Russia*
· specializing in 'Information Science and Computers'; GPA 5.0/5.0

RESEARCH EXPERIENCE

Research Assistant, UNSW, Faculty of Science, Climate Change Research Center February 2018-Current
· used compiler options and Intel MKL to increase performance of a Fortran data analysis code by 20 to 50%

Research Assistant, UNSW, Faculty of Engineering September 2018-Current
· used ANSYS and Acri Answer+ to study a hall in joint with Gandhinagar IIT, India, increasing ventilation 3-5 times
· used ANSYS SpaceClaim for CAD and ANSYS CFX for CFD, and HPC at Raijin, NCI, for an aerodynamics project
· performs ongoing research in the area of natural convection in application to passive cooling of photovoltaics

PhD candidate, Faculty of Engineering 2014-2018
University of New South Wales *Sydney, NSW, Australia*
· Thesis title: 'Coupling of radiation and natural convection in open-ended channel in application to building integrated photovoltaic systems'
· tested impact of radiation on the performance of a sustainable double-skin building facade arrangement
· used Large Eddy Simulation turbulence model via in-house Fortran code to model transitional natural convection
· consulted with a researcher in the US to choose a non-grey absorption properties model to add in the code
· used and wrote scripts in Perl, Tecplot and MATLAB to post-process the flow field and turbulent statistics
· showed possibility of an up to 10% increase of the electrical output of the PV skin in case of higher wall radiation

Bachelor with Honours thesis student 2007-2012
Dubna International University of Nature, Society and Man, Russia *Moscow Oblast, Russia*
· Thesis title: 'Modelling of an open power-generating system based on thermodynamic properties of Earth atmosphere with means for heat release into outer space'
· added, completed advanced electives in general physics, calculus, linear algebra, differential equations
· completed the programme using distance education, passed exams via video conferencing

TEACHING EXPERIENCE

Casual Academic, UNSW: Tutor, MATH2089 Numerical methods 2015-2017
· demonstrated at whiteboard and led computer labs for 30-40 students class, with another tutor
· guided the other tutor about the demonstrating and marking procedures

Casual Academic, UNSW: Tutor, MECH4620 Computational Fluid Dynamics 2015-2017
· led computer labs to a 50-100 students class shared with another tutor
· provided feedback to students for major modelling project in ANSYS CFX or FLUENT to improve the outcome
· checked quality of problem formulation, literature review, justification of chosen turbulence techniques

Casual Academic, UNSW: Student mentor, Bachelor and Master thesis projects 2016-2018
· mentored two undergraduate thesis students and one master student for 2 semesters each
· advised in topics connected with my PhD thesis, heat transfer in double-skin facades in PV applications
· introduced the students to high-performance computing

Casual Academic, UNSW: Student advisor, Bachelor thesis projects 2016-2018
· consulted undergraduate students on their computational fluid dynamics (CFD) thesis projects
· advised on projects with unfamiliar topics including medical, aerospace, ships, supersonic flow
· guided implementation of interpolation, differentiation, visualization, file operations in MATLAB

INDUSTRY EXPERIENCE

Web backend developer January-July 2013
UK2.net *United Kingdom*
· developed website backend in Perl using the Dancer framework and DBIX modules for databases
· parsed RSS feeds, queried banks and news and website APIs to generate output with error handling
· performed and added unit tests to ensure the functions of the code are not broken by changes
· communicated with employer located in United Kingdom using text chat via Internet
· collaborated and updated codes to match newer revision of the codes using git for revision control

RELEVANT SKILLS

Spoken languages	Russian (native), English (fluent)
Document processing	LyX, LaTeX, Microsoft Office, LibreOffice
Programming	MATLAB, Fortran, Perl, JavaScript, Python, C++, C, Pascal
Data visualisation	ANSYS CFX/FLUENT (trained), Tecplot, MATLAB, Paraview, Perl
HPC	SSH, WinSCP, PBS and Slurm

MEMBERSHIPS

Free Software Foundation 2014-2019
· participate in informing new members of free software that addresses their needs

National Tertiary Education Union 2018-2019
· help to organise campaigns for the NTEU Casuals Network at UNSW

The Greens NSW 2018-2019
· query petition and campaign organisers electronically, sign petitions

VOLUNTEERING

Volunteer contributor at freenode and Mozilla live chat networks 2009-2019
· communicated in text chat in real time about technical topics in a group channel discussion
· provided support about usage, testing, and development for web, chat, server and desktop applications

Volunteer add-ons reviewer at addons.mozilla.org 2010-2014, 2016-2017
· read code and tested submissions to ensure they follow the policies and UX practices
· approved 132 add-on versions, requested info for 8 and rejected 15 add-on versions

Volunteer developer contributor to applications for Firefox, Wikimedia 2011-2018
Wikimedia Foundation, Mozilla Foundation, NOKIA, GNU *online*
· created JavaScript tools for Wikipedia using MediaWiki API to improve collaboration and review
· created navigation and browsing apps for Maemo mobile platform (NOKIA) in C with GTK

Volunteer peer reviewer and administrator for Wikinews 2011-2019
· fact-checked news articles written by volunteers to produce relevant entertaining news without bias
· communicated with article authors about what work needs to be done
· approved 11 articles, requested revisions for 41 articles which were later published

Recipient of 'Best GReen INnovation (GRIN) idea' award 2016, 2018
Randwick City Council *Sydney, NSW, Australia*
· proposed using publiclab.org and osm.org for public and transparent discussion of local issues in 2018
· proposed to create an online portal for noise map and noise ratings of common products in 2016
· submitted the ideas to Randwick City Council for an official competition, got 'highly commended'

Volunteer at Bike-ology workshop at UNSW, Sydney 2017-2019
· participated in 2-hour bicycle repair workshops on regular weekly basis
· processed approximately 4-5 problems in each session

Volunteer 'Being Excited About Reading' parent at South Coogee Public School, Sydney 2018-2019
· performed 30-minute structured reading and writing lessons with two children per week
· kept a written journal of the students performance in reading and writing

Volunteer 'age assistant' at Coogee Minnows, Sydney 2018-2019
· guided children activities on sand and in water at the beach each Sunday
· followed the training and procedures for counting the number of children in the group

PUBLICATIONS

Journal papers
· **Tkachenko, S. A.**, Lau, G. E., Timchenko, V., Yeoh, G. H., Reizes, J. (2018). Effects of radiation on turbulent natural convection in channel flows. International Journal of Heat and Fluid Flow.
· **Tkachenko, S. A.**, Lau, G. E., Timchenko, V., Yeoh, G. H., Reizes, J. (2016). Effect of heat loss on turbulent buoyancy-driven flow in a rectangular cavity using the large-eddy simulation. Numerical Heat Transfer, Part A: Applications, 70(7), 689-706.

Presentations
· **Tkachenko S. A.**, Timchenko V., Yeoh G., Reizes J., 2018, 'Effects of radiation on turbulent natural convection and heat transfer in building-integrated photovoltaic systems', in 11th Australasian Heat and Mass Transfer Conference, AHMTC11, RMIT University, Melbourne, Australia
· **Tkachenko, S. A.**, Timchenko V., Yeoh G. H., Reizes J. Effects of radiation on single-phase turbulent natural convection and heat transfer in building-integrated photovoltaic systems. In Australaisian Natural Convection Workshop (p. 32), Auckland, New Zealand, 2017.
· **Tkachenko, S. A.**, Timchenko V., Yeoh G. H. A study of the effects of radiation on single-phase turbulent natural convection and heat transfer in building-integrated photovoltaic systems. UNSW Postgraduate Engineering Research Symposium, 2017.
· **Tkachenko, S. A.**, Timchenko, V., Yeoh, G. H., Reizes, J. A. (2015). Effects of humidity on natural convection in a differentially heated cubic cavity. In ICHMT digital library online. Begel House Inc. 2015

Peer reviewed conference papers

- **Tkachenko S. A.**, Timchenko V., Yeoh G., Reizes J., 2018, 'Effects of radiation on turbulent natural convection and heat transfer in building-integrated photovoltaic systems', in 11th Australasian Heat and Mass Transfer Conference, AHMTC11, RMIT University, Melbourne, Australia
- Timchenko V, **Tkachenko, S. A.**, Reizes J., Lau G.E., Yeoh G.H., Is comparison with experimental data a reasonable method of validating computational models?. In Journal of Physics: Conference Series 2016 Sep (Vol. 745, No. 3, p. 032022). IOP Publishing.
- **Tkachenko, S. A.**, Timchenko V., Yeoh G.H., Reizes J.A. Effects of humidity on natural convection in a differentially heated cubic cavity. In ICHMT digital library online 2015. Begel House Inc. 2015
- Tkachenko O.A., **Tkachenko S. A.**, Timchenko V., Reizes J., Yeoh G.H., de Vahl Davis G. Three-dimensional computational study of natural convection in a non-uniformly heated vertical open-ended channel. In Kyoto, Japan: 15th International Heat Transfer Conference (IHTC15) 2014.

Peer reviewed workshop papers

- **Tkachenko, S. A.**, Timchenko V., Yeoh G.H., Reizes J. Effects of radiation on single-phase turbulent natural convection and heat transfer in building-integrated photovoltaic systems. In Australaisian Natural Convection Workshop (p. 32), Auckland, New Zealand, 2017.
- **Tkachenko, S. A.**, Timchenko V., Yeoh G.H., Reizes J. Effect of top boundary heat loss on turbulent flow in a rectangular cavity. In Australaisian Natural Convection Workshop, University of Sydney, NSW, Australia, 2015.

PREVIOUS EDUCATION

Standardized US college admissions test (SAT) 2008

- Chemistry, Physics, Math L2 & 800 of 800; Biology E & 780 of 800

'Small MechMath' course at Moscow State University, High Distinction 2002-2007

High school certificate with High Distinction; home schooled; GPA 5.0/5.0 2007

Pushkino School #9 *Moscow Oblast, Russia*