YANG WANG
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Interests:

- Computational Fluid Dynamics (CFD) in multi-disciplinary applications
- Heat and mass/species transfer/transport problems
- CAD/Node-based shape deformation and gradient-based optimisation
- Numerical modelling and optimization

Skills:

- Finite Volume Method and Spectral Element Method
- Numerical methods for Partial Differential Equations: algorithms, discretisation schemes and linear solvers
- Fortran, MATLAB/Octave and C++ programming
- Chemical Engineering process/system simulation tool: Aspen Plus
- CFD tools/software such as GMSH, ICEM, ParaView, OpenFOAM, Fluent and etc
- Automatic Differentiation tool TAPENADE
- Linux operation systems, Vim, Make, Meld, Git, Doxygen, Gprof, and HYPRE open source libraries

Education:

- 2012.9 – 2017.1 PhD in Mechanical Engineering, Queen Mary, University of London, United Kingdom
- 2009.9 – 2012.6 MSc in Power Engineering and Thermophysics, Xi'an Jiaotong University, China
- 2005.9 – 2009.7 BEng in Energy and Power Engineering, Xi'an Jiaotong University, China

Academic experience:

- 2017. 11-present Full/part-time parent and work from home during relocation, Cambridge, USA

  - ➢ Mass/species transportation coupling with standard CFD flow solvers
  - ➢ Multi-phase flow based on the Volume Of Fluid (VOF) method
  - ➢ Journal papers writing and revision; paper reviewing work invited by journal editors

- 2017.3 – 2017.10 Research fellow on Engineering and Physical Science Research Council (EPSRC) funded projects, School of Engineering, University of Warwick, Coventry, United Kingdom

  - ➢ Next Generation Grid Scale Thermal Energy Storage Technologies: Novel system design for Compressed Air Energy Storage (CAES) coupled with Reverse Osmosis (RO) water producing process
  - ➢ Ultra-Supercritical (USC) steam power generation technology with Circulating Fluidized Bed (CFB): Combustion, Materials and Modelling: Heat transfer numerical model of CFB boiler integrated with water-wall heat exchange

- 2012.9 – 2017.1 PhD candidate working on EU projects AboutFlow

  - ➢ Development of integrated CFD and adjoint sensitivity solvers
  - ➢ SIMPLE-like algorithms vs. Pressure Schur Complement (PSC) method theatrical derivation
  - ➢ Automatic Differentiation (AD) for CFD code based on source transformation (TAPENADE)
  - ➢ Fluid dynamics analysis on air duct cases in Volkswagen Golf vehicle
  - ➢ CAD-based shape optimization with mesh deformation based on linear elasticity theory
  - ➢ Membrane process modelling and governing equations implementation
  - ➢ Fluid dynamics combined with filaments surface sensitivity analysis on spacers design in membrane channel

- 2009.9 – 2012.6 Master Thesis: Study of spectral element method for acoustic propagation problem in non-uniform flows

- ➢ The numerical model of acoustic propagation derivation for non-uniform flow
- ➢ Implementation of group velocity method with high accuracy on the absorbing boundary conditions
- 2008.9 – 2009.6 Bachelor thesis: The design of vortex blower working on high flow rate
  - ➢ High flow rate vortex blower design and 3D model via software Pro-E

Selected Publications:

1. Wang Y, He W, Mueller JD. Re-visit SIMPLE-like algorithms via Pressure Schur Complement for stabilisation of discrete adjoint solver with industrial incompressible flow application, in preparation.

2. Wang Y, He W, Wang JH. Pumped seawater combined with Compressed Air Energy Storage: an integrated co-storing/producing energy/water system. *Applied Energy*, under revision.

3. Wang Y, He W, Mueller JD. Sensitivity analysis of feed spacer shape in reverse osmosis membrane process using discrete adjoint approach, *Desalination*, under revision.

4. Wang Y, He W, Zhu Hai. Computational fluid dynamics (CFD) based modelling of osmotic energy generation using pressure retarded osmosis (PRO), *Desalination*, 2016; 389: 98-107.

5. Zhang X, Wang Y, Gugala M, Mueller JD. Geometric continuity constraints for adjacent NURBS patches in shape optimisation. Eccomas 2016.

6. Wang Y, Akbarzadeh S, Mueller JD. Stabilisation of discrete adjoint Solvers for Incompressible Flow. 22nd AIAA Computational Fluid Dynamics Conference, AIAA AVIATION Forum, 2015.

7. He W, Wang Y, Shaheed MH. Evaluation of the detrimental effects in osmotic power assisted reverse osmosis (RO) desalination. *Renewable Energy*, 2016; 93: 608-619.

8. He W, Wang Y, Shaheed MH. Maximum power point tracking (MPPT) of the scale-up pressure retarded osmosis (PRO) osmotic power plant, *Applied Energy* 2015, 158: 584-596.

9. He W, Wang Y, Shaheed MH. Stand-alone seawater RO (reverse osmosis) desalination powered by PV (photovoltaic) and PRO (pressure retarded osmosis). *Energy*, 2015, 86: 423-435.

10. Geng Y, Qin G, Wang Y, He W. The research of space-time coupled spectral element method for acoustic wave equations. *Chinese Journal of Acoustics*. 2016; 1:003.

Awards and grants

- 2015 Postgraduate Research Fund from QMUL
- 2014 Student grant from SEMS
- 2012 Best Graduates (Top 10%)
- 2010 Outstanding Postgraduate Student Award (Top 15%)
- 2009 Postgraduate Innovation Fund Scholarship (1st Class, 2/46)
- 2009 Best Graduates (Top 10%)
- 2008 *Fusheng* Scholarship (1ST Class, Top 15%)

Teaching and supervising experiences:

- 2012-2015 Demonstrating in modules:
  - ➢ Heat Transfer: teaching assistant
  - ➢ Fluid Mechanics: experiments demonstration
  - ➢ Computational Fluid Dynamics: OpenFOAM tutorial
- 2009-2012 Director of Class 2009 in Department of Fluid Machinery