Will Trojak

Research Curriculum Vitæ

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Academic Positions

2019–Present   **PostDoc**, *Texas A & M University, USA*, Ocean Engineering Department.
Supervisor: Dr. Freddie Witherden

Education

2016–2019   **Ph.D**, *University of Cambridge*, Department of Engineering.
Title: Numerical Analysis of Flux Reconstruction
Supervisor: Prof. Stewart Cant
Advisor: Prof. Paul G. Tucker

2015–2016   **M.Eng**, *University of Cambridge*, Department of Engineering, *first class (hons)*.
Dissertation title: High-Order Unstructured Computational Fluid Dynamics
Supervisor: Prof. Paul G. Tucker
Awards: Shell Best Project Prize
Relevant modules: 4A2 - CFD, 4A7 - aerodynamics, 4A9 - molecular thermodynamics, 4A13 - turbulence and vortex dynamics
Accredited for: Aeronautical, Mechanical and General Engineering

2012–2015   **BA**, *University of Cambridge*, Department of Engineering, *first class (hons)*.
Relevant modules: 3A1/3A3 - incompressible/compressible fluid dynamics, 3A5 - Thermodynamics and Power Generation
Awards: first year computing prize (C++ based stock trading)

Teaching Experience

2019   **Supervising**, *Part Ia*, P1 - Numerical Analysis.

2018–2019   **Supervising**, *Part IIb*, Masters Dissertation.
Overseen by Prof. Stewart Cant I am supervising a Masters student for their dissertation on 'Optimal Flux Reconstruction Correction Functions for Implicit LES'

2018   **Demonstrating**, *Part IIb*, 4A2 - Computational Fluid Dynamics.

2017   **Demonstrating**, *Part IIa*, GA3 - Turboexpander mini project.

2017–2018   **Supervising**, *Part Ia*, P1 Mechanics.

2017   **Demonstrating**, *Part IIb*, 4A2 - Computational Fluid Dynamics.

Experience

June-September 2016   **Lead Software Engineer**, *Amberbox Inc.*, London Office.
Lead software engineer for a low power gunshot detector during 'Y Combinator' summer 2016 seeding program.

June-September 2015	**Undergraduate Researcher**, *University of Cambridge*, Department of Engineering. Research and development of a Flux Reconstruction implementation for use in my master dissertation.
June-September 2014	**Undergraduate Researcher**, *University of Cambridge*, Institute for Manufacturing. Research and development of a large scale force breakup water jet demonstrator
2012–2015	**Officer Cadet**, *Cambridge University Air Squadron*.

Journal Publications

1. **W. Trojak**, R. Watson, and P.G. Tucker. High Order Flux Reconstruction on Stretched and Warped Meshes. *AIAA Journal*, 57, 1, 2018, pp. 341-351.
2. J. Tyacke, N.R. Vadlamani, **W. Trojak**, R. Watson, Y. Ma, and P.G. Tucker. Turbomachinery simulation challenges and the future. *Progress in Aerospace Sciences* 110, 2019, pp. 100554.
3. **W. Trojak**, R. Watson, A. Scillitoe, and P.G. Tucker. Effect of Mesh Quality on Flux Reconstruction in Multi-Dimensions. *Journal of Scientific Computing*, 82, 77, 2019.
4. **W. Trojak**. A Generalising Approach to Energy Stable Flux Reconstruction Correction Functions. *Journal of Computational Physics*, Submitted May 2018.
5. **W. Trojak**, and F.D. Witherden. A New Family of Weighed One-Parameter Flux Reconstruction Schemes. *Computer Methods in Applied Mechanics and Engineering*, Submitted September 2018.
6. **W. Trojak**, and F.D. Witherden. Inline Vector Compression for Computational Physics. *Computer Physics Communications*, Submitted February 2020.

Conference Papers

1. **W. Trojak**, R. Watson, and P.G. Tucker. High Order Flux Reconstruction on Stretched and Warped Meshes, Paper AIAA-2017-0521, *55th AIAA Aerospace Sciences Meeting*, Grapevine, TX, Jan 2017.
2. **W. Trojak**, R. Watson, and P.G. Tucker. Temporal Stabilisation of Flux Reconstruction on Linear Problems, Paper AIAA-2018-4263, *Fluid Dynamics Conference, AIAA AVIATION Forum*, Atlanta Georgia, June 2018.
3. R. Watson, **W. Trojak**, and P.G. Tucker. A Simple Flux Reconstruction Approach to Solving a Poisson Equation to Find Wall Distances for Turbulence Modelling, Paper AIAA-2018-4261, *Fluid Dynamics Conference, AIAA AVIATION Forum*, Atlanta Georgia, June 2018.
4. J. Tyacke, R. Watson, **W. Trojak**, and P.G. Tucker. High Fidelity Turbomachinery Simulation. *12th International ERCOFTAC Symposium on Engineering Turbulence Modelling and Measurements*, Montpellier France, Sept 2018.
5. **W. Trojak**, A. Scillitoe, and R. Watson. Effect of Flux Function Order and Working Precision in Spectral Element Methods, Paper AIAA-2020-0566, *58th AIAA Aerospace Sciences Meeting*, Orlando, FL, Jan 2020.

Oral Presentations

1. **W. Trojak**, R. Watson, and P.G. Tucker. High Order Flux Reconstruction on Stretched and Warped Meshes, Paper AIAA-2017-0521, *55th AIAA Aerospace Sciences Meeting*, Grapevine Texas, Jan 2017.
2. **W. Trojak**, R. Watson, and P.G. Tucker. Temporal Stabilisation of Flux Reconstruction on Linear Problems, Paper AIAA-2018-4263, *Fluid Dynamics Conference, AIAA AVIATION Forum*, Atlanta Georgia, June 2018.
3. **W. Trojak**, A. Scillitoe, and R. Watson. Effect of Flux Function Order and Working Precision in Spectral Element Methods, Paper AIAA-2020-0566, *58th AIAA Aerospace Sciences Meeting*, Orlando, FL, Jan 2020.

Computer skills

- Fortran - 77-18 standards including: OpenMP, coarraries and MPI. Attended: Knights Landing (KNL) vectrorisation course run by Archer; and Intel HPC DevCon 2017.
- CUDA Fortran - including CUDA toolkit libraries for GPU acceleration. Attended courses on OpenACC and CUDA Fortran.
- git - both for code base and latex management
- linux
- matlab - experienced user
- python - intermediate experience

Private git repositories on request (`bitbucket.org/WillTrojak`), public git at `github.com/WillTrojak`

Referees

On request