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Curriculum Vitæ

Education

2015–2016 **Postdoctoral scholar**, *Department of Aeronautics, Imperial College London*, UK.
2018–
- Advisor: Dr Peter Vincent.

2016–2018 **Postdoctoral scholar**, *Department of Aeronautics & Astronautics, Stanford University*, USA.
- Advisor: Prof. Antony Jameson.

2012–2015 **PhD**, *Department of Aeronautics, Imperial College London*, UK.
- Advisors: Dr Peter Vincent and Prof. Spencer Sherwin.
- Title: On the Development and Implementation of High-Order Flux Reconstruction Schemes for Computational Fluid Dynamics.

2008–2012 **MSci Physics with Theoretical Physics**, *Department of Physics, Imperial College London*, UK.
- First-class honours.

Experience

2014– **Partner at Quadrature Solutions LLP**.
Founding partner of computational science and engineering consultancy partnership Quadrature Solutions.

2016–2018 **Co-founder of Kopernio Limited**.
Co-founder and CTO of the AI technology firm Kopernio. In March 2018 Kopernio was acquired by Clarivate Analytics.

2012–2015 **Director of newsflo Ltd**.
Co-founder and CTO of news analytics firm newsflo. In January of 2015 newsflo acquired by Elsevier.

Journal publications

1. N. A. Loppi, **F. D. Witherden**, A. Jameson, and P. E. Vincent,
   A High-Order Cross-Platform Incompressible Navier–Stokes Solver via Artificial Compressibility with Application to a Turbulent Jet.
   Submitted for publication in Computer Physics Communications.
2. J. A. Crabill, **F. D. Witherden**, and A. Jameson,
   A Parallel Direct Cut Algorithm for High-Order Overset Methods with Application to a Spinning Golf Ball.
   Submitted for publication in the Journal of Computational Physics.
3. **F. D. Witherden** and A. Jameson,
   On the Impact of Number Representation for High-Order Implicit Large Eddy Simulations.
   Submitted for publication in Communications in Computational Physics.
4. **F. D. Witherden** and A. Jameson,
   On the Spectrum of the Steger–Warming Flux Vector Splitting Scheme.
   International Journal of Numerical Methods in Fluids, 2018.
5. J. Romero, **F. D. Witherden**, and A. Jameson,
   A Direct Flux Reconstruction Scheme for Advection-Diffusion Problems on Triangular Grids.
   Journal of Scientific Computing, 73(2–3), 2017, 1115–1144.
6. J. S. Park, **F. D. Witherden**, and P. E. Vincent,
   High-Order Accurate Implicit Large Eddy Simulations of Flow over a NACA0021 Aerofoil in Deep Stall.
   AIAA Journal, 55(7), 2017, 2186-2197.
7. B. C. Vermeire, **F. D. Witherden**, and P. E. Vincent,
   On the Utility of GPU Accelerated High-Order Methods for Unsteady Flow Simulations: A Comparison with Industry-Standard Tools.
   Journal of Computational Physics, 334, 2017, 497–521
8. **F. D. Witherden**, J. S. Park, and P. E. Vincent,
   An Analysis of Solution Point Coordinates for Flux Reconstruction Schemes on Tetrahedral Elements.
   Journal of Scientific Computing, 69(2), 2016, 905–920.
9. B. D. Wozniak, **F. D. Witherden**, F. P. Russell, P. E. Vincent, and P. H. J. Kelly,
   GiMMiK—Generating bespoke matrix multiplication kernels for accelerators: Application to high-order Computational Fluid Dynamics.
   Computer Physics Communications, 202, 2016, 12–22.

10. **F. D. Witherden**, B. C. Vermeire, and P. E. Vincent,
Heterogeneous computing on mixed unstructured grids with PyFR. Computers & Fluids, 120, 2015, 173–186.
11. P. E. Vincent, A. M. Farrington, **F. D. Witherden**, and A. Jameson,
An extended range of stable-symmetric-conservative Flux Reconstruction correction functions.
Computer Methods in Applied Mechanics and Engineering, 296, 2015, 248–272.
12. **F. D. Witherden** and P. E. Vincent,
On the Identification of Symmetric Quadrature Rules for Finite Element Methods.
Computers & Mathematics with Applications, 69(10), 2015, 1232–1241.
13. **F. D. Witherden**, A. M. Farrington, and P. E. Vincent,
PyFR: An Open Source Framework for Solving Advection-Diffusion Type Problems on Streaming Architectures Using the Flux Reconstruction Approach.
Computer Physics Communications, 185(11), 2014, 3028–3040.
14. **F. D. Witherden** and P. E. Vincent,
An Analysis of Solution Point Coordinates for Flux Reconstruction Schemes on Triangular Elements.
Journal of Scientific Computing, 61(2), 2014, 398–423.

Conference publications

1. **F. D. Witherden** and A Jameson,
Future Directions of Computational Fluid Dynamics.
Paper AIAA-2017-3791, 23rd AIAA Computational Fluid Dynamics Conference, 5–9 June 2017, Denver, Colorado, USA.
2. P. E. Vincent, **F. D. Witherden**, B. C. Vermeire, J. S. Park, and A. S. Iyer,
Towards Green Aviation with Python at Petascale.
ACM Gordon Bell Finalist and Best Paper Finalist. Article 1. SC16, 13–18 November 2016, Salt Lake City, Utah, USA.
3. M. Klemm, **F. D. Witherden**, and P. E. Vincent,
Using the pyMIC Offload Module in PyFR.
Proceedings of EuroSciPy 2015.
4. B. C. Vermeire, **F. D. Witherden**, and P. Vincent,
On the Utility of High-Order Methods for Unstructured Grids: A Comparison Between PyFR and Industry Standard Tools.
Paper AIAA-2015-2743, 22nd AIAA Computational Fluid Dynamics Conference, 22–26 June 2015, Dallas, Texas, USA.

5. P. Vincent, **F. D. Witherden**, A. M. Farrington, G. Ntemos, B. C. Vermeire, J. S. Park, and A. S. Iyer,
   PyFR: Next-Generation High-Order Computational Fluid Dynamics on Many-Core Hardware.
   Paper AIAA-2015-3050 (invited), 22nd AIAA Computational Fluid Dynamics Conference, 22–26 June 2015, Dallas, Texas, USA.
6. G. Mengaldo, D. De Grazia, J. Peiro, A. Farrington, **F. D. Witherden**, P. E. Vincent, and S. J. Sherwin,
   A Guide to the Implementation of Boundary Conditions in Compact High-Order Methods for Compressible Aerodynamics.
   Paper AIAA-2014-2923, 7th AIAA Theoretical Fluid Mechanics Conference, 16–20 June 2014, Atlanta, Georgia, USA.

Book chapters

1. **F. D. Witherden** and A. Jameson,
   Aerodynamics.
   In Encyclopedia of Computational Mechanics Second Edition, edited by E. Stein, R. de Borst, and T. J. R. Hughes. Wiley, 2017.
2. **F. D. Witherden**, A. Jameson, and D. W. Zingg,
   The Design of Steady State Schemes for Computational Aerodynamics.
   In Handbook of Numerical Analysis XVIII: Handbook of Numerical Methods for Hyperbolic Problems: Applied and Modern Issues, 303–349, edited by R. Abgrall and C-W. Shu. Elsevier, 2017.
3. **F. D. Witherden**, P. E. Vincent, and A. Jameson,
   High-Order Flux Reconstruction Schemes.
   In Handbook of Numerical Analysis XVII: Handbook of Numerical Methods for Hyperbolic Problems, 227–263, edited by R. Abgrall and C-W. Shu. Elsevier, 2016.
4. J. Enkovaara, M. Klemm, and **F. D. Witherden**,
   High Performance Python Offloading.
   In High Performance Parallelism Pearls Volume 2, 246–269, edited by J. Jeffers and J. Reinders. Morgan Kaufmann, 2015.

Posters (refereed)

1. **F. D. Witherden**, B. D. Wozniak, F. P. Russell, P. E. Vincent, and P. H. J. Kelly,
   Beating cuBLAS: Automatically Generating Bespoke Matrix Multiplication Kernels Using GiMMiK.
   SC15, 15–20 November 2015, Austin, Texas, USA.

2. **F. D. Witherden**, B. C. Vermeire, and P. E. Vincent,
PyFR: An Open Source Python Framework for High- Order CFD on Heterogeneous Platforms.
SC14, 16–21 November 2014, New Orleans, Louisiana, USA.

Teaching

2017 CME207: Introduction to Numerical Methods.

2017 XCME009: Introduction to Python.

2017 TA for AA215A: Advanced Computational Fluid Dynamics.

2016–2017 TA for AA214C: Numerical Methods for Viscous Flows.

Achievements

2016 ACM Gordon Bell Prize finalist.

2010 Dr Richard Learner Prize for the top student in second year Physics laboratory.

Interests

Forensics Have conducted extensive research in the field of volatile memory forensics. Author of the widely-used software library libforensic1394.

Software Active contributor to various free software projects since 2006.

References

References are available on request.