Dominic Jones

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Professional work

Oct 2019 – Present	**Senior developer, Siemens PLM, London** Developing a programming infrastructure for differentiating numerical algorithms for the engineering software Star-CCM+.
Sep 2016 – Sep 2019	**Director, Netherhall House, London** Jointly responsible for the academic, cultural and formational activities of the hall of residence for university students.
Jul 2016 – Sep 2017	**Consultant, CD-adapco / Siemens PLM, London** Designed a compile-time methodology for generating the adjoint derivative of a function. This research work is a proposed tool to complement the existing abstractions for implementing the adjoint of the Navier-Stokes equations in Star-CCM+, an engineering software simulation package from CD-adapco.
Jan 2012 – Jul 2016	**Senior developer, CD-adapco, London** Designed and implemented components of the adjoint differentiation of the Navier-Stokes equations in Star-CCM+, along with its low-level testing framework. The work of implementing the adjoint derivative touched most of the core codebase, of which I made significant contributions to.

University studies

Oct 2019 – Present	**Doctoral research, Philosophy, University of Reading** Examining what it means for an effect to be found in its causes in a virtual manner, as proposed by the principle of proportionate causality. Supervised by Prof. David Oderberg.
Sep 2018 – Sep 2019	**MA Philosophy, Buckingham** Masters by research directed by Sir Roger Scruton. The thesis topic 'Composition in change: A hylemorphic view' aimed to defend a contemporary view of Aristotelian-Thomistic metaphysics, principally drawing from work by D. Oderberg and E. Feser and contrasting it with work by H. Robinson, E. J. Lowe and D. Papineau.
Apr 2009 – Dec 2011	**Post-doctoral research, Queen Mary, University of London** Developed a source-code transformation approach to generating the adjoint derivative of the Navier-Stokes equations. This approach was then applied to commercial software. In addition, a domain-decomposed parallel implementation of a Navier-Stokes solver was written in order to explore the extension of the approach to parallel algorithms.
Sep 2005 – Jan 2009	**Doctoral research, Engineering, University of Manchester** Attempted to resolve the Further Work of two theses on simulating spray propagation and impaction, from an Eulerian frame of reference. This work presented solutions to spray edge capturing, the inversion of probability density functions, capturing flow details at very small scales, and interaction of interpenetrating sprays.
Sep 2002 – Jun 2005	**Bachelor of Mechanical Engineering, UMIST, Manchester** Specialised in Thermodynamics and Computational Fluid Dynamics. The final year project examined the behaviour of LPG fuel sprays using an academic spray simulation code.

Academic topics

Ph.D Philosophy	Causal principles | Substance | Hierarchy of being
MA Philosophy	Change | Hylemorphic composition | Mind-body problem
Post-doc Engineering	Automatic differentiation | Parallel computation (domain decomposition)
Ph.D Engineering	Spray hydrodynamics | Probability density functions | Linear algebra
BEng	Thermodynamics | Fluid dynamics | Computational fluid dynamics

Presentations and publications

Dominic Jones. Particulars, concepts, Universals and the Transcendentals. *Transcendentals in the 21st Century*, Trogir, Croatia, September 2019

Dominic Jones. Compile time adjoint in C++. *22nd European Workshop on Automatic Differentiation*, Imperial College, London, July 2019

Dominic Jones. Metaphysics, natural theology and epistemology from a classical realist perspective. *Sedes Sapientiae summer course*, Norfolk, July 2019

Dominic Jones. Can machine become man? Considerations on substance and freedom. *IIS 2019*, Netherhall House, London, January 2019

Dominic Jones. Float template parameter: A workaround. *C++ Meetup*, London, November 2018

Dominic Jones. Compile time functions: An introduction. *C++ Meetup*, London, August 2018

Dominic Jones. Expression tree transforms: For compile-time differentiation. *C++ Meetup*, London, March 2018

Dominic Jones. Sequential processing in nature, 'anything but' in scientific computation. *IIS 2018*, Netherhall House, London, January 2018

Dominic Jones. Reflecting on names: Facilitating expression tree transforms. *C++ Meetup*, London, October 2017

D. P. Jones. Block scope differentiation. In *7th International Conference on Algorithmic Differentiation*, Oxford, UK, September 2016. SIAM

D. P. Jones. Discrete adjoint; an industrial perspective. *14th European Workshop on Automatic Differentiation*, Oxford University, December 2013

J.-D. Muller, D. P. Jones, W. Jahn, and S. Xu. Discrete adjoint solvers for industrial design optimisation. In *Conference on Industrial Design Optimisation for Fluid Flow*, Munich, Germany, March 2012. Technical University Munich

D. P. Jones and A. P. Watkins. Droplet size and velocity distributions for spray modelling. *Journal of Computational Physics*, 231(2):676–692, July 2012

D. P. Jones, J.-D. Muller, and F. Christakopoulos. Preparation and assembly of adjoint cfd codes. In Peter K. Sweby, editor, *10th ICFD Conference Series on Numerical Methods for Fluid Dynamics*, volume 46, pages 282–286, Reading, UK, July 2011. Computers & Fluids

D. P. Jones, J.-D. Muller, and J. Riehme. Discrete adjoint of the incompressible Navier-Stokes equations. *11th European Workshop on Automatic Differentiation*, Oxford University, December 2010

D. P. Jones, F. Christakopoulos, and J.-D. Muller. Adjoint cfd codes through automatic differentiation. In A. Sequeira J. C. F. Pereira and J. M. C. Pereira, editors, *Proceedings of the V European Conference on Computational Fluid Dynamics*, Lisbon, Portugal, June 2010. ECCOMAS CFD

D. P. Jones, J.-D. Muller, and J. Riehme. Discrete adjoint of the incompressible Navier-Stokes equations. *11th European Workshop on Automatic Differentiation*, Oxford University, December 2010

D. P. Jones and A. P. Watkins. Spray impingement model based on the method of moments. *ILASS-Europe*, 2008

D. P. Jones. Spray modelling using the method of moments. *CoMo Group, Department of Chemical Engineering and Biotechnology*, Cambridge University, December 2008