Giacomo Castiglioni

7 A Porchester Square
W2 6AL, London, UK

+44 7490 650026
giacomocastiglioni@hotmail.com

Education

- **PhD in Aerospace Engineering**
  - Research in Computational Fluid Dynamics of separated flows *5/2015*
  University of Southern California, Los Angeles, USA
- **MS in Aerospace and Mechanical Engineering**
  - Computational Fluid and Solid Mechanics *12/2011*
  University of Southern California, Los Angeles, USA
- **MS coursework in Mechanical Engineering**
  Technical University of Delft, The Netherlands *8/2008 – 8/2009*
- **BS in Mechanical Engineering**
  Politecnico of Milan, Italy *2/2009*

Employment

- **Research Associate**
  - High fidelity simulations (LES/DNS) to predict shock wave unsteadiness in turbofan intake cowls at off design condition *7/2018 - Present*
  - Implementation and validation of shock capturing schemes in a open source high-order finite element CFD software
  Imperial College, London, UK
- **Postdoctoral Fellow**
  - DNS simulations of multi-species high-pressure flows relevant to fuel injection *11/2016 - 6/2018*
  - Implemented a thermodynamic model to predict phase of fuel-air mixture
  California Institute of Technology / NASA JPL, Pasadena, USA
- **Senior Engineer external aerodynamics**
  - Responsible for researching new CFD methodologies *7/2016 - 10/2016*
  Tesla Motors, Hawthorne, USA
- **Senior Engineer thermal/aero systems**
  - Responsible for HVAC aerodynamics of Model 3 *7/2015 - 7/2016*
  - Main CFD analyst for HVAC system
  - Submitted a patent for novel air vent design
  Tesla Motors, Palo Alto, USA
- **Research Assistant**
  - Prediction of laminar separation bubbles over wing/blade geometries *Fall 2010 - 2015*
  - Large Eddy Simulations
  - Quantification of numerical dissipation
  - Immersed Boundary, Finite Volume code
  - Parallel computing
  University of Southern California, Los Angeles, USA
- **Computational Fluid Dynamics Analyst**
  - Summer internship, simulations run on a cluster with STAR-CCM+ software *5/2012 - 8/2012*
  Tesla Motors, Fremont, USA

- **Teaching Assistant**
  - AME 499 Turbine Design and Analysis — *Fall 2010 - Fall 2013*
  - AME 408 Computer-Aided Design of Mechanical Systems (SolidWorks/CosmosWorks)
  - AME 301 Dynamics
  - AME 150 Introduction to Computational Methods (MATLAB)

  University of Southern California, Los Angeles, USA

Reviewing activity

1. Reviewer for *Journal of Computational Physics*, *Journal of Fluid Mechanics*

Journal papers

1. G. Castiglioni and J.R. Bellan. On models for predicting thermodynamic regimes in high-pressure turbulent mixing and combustion of multi-species mixtures. *J. Fluid Mech.*, 843:536–574, 2018
2. G. Castiglioni and J.A. Domaradzki. A numerical dissipation rate and viscosity in flow simulations with realistic geometry using low-order compressible Navier-Stokes solvers. *Comp. & Fluids*, 119:37–46, 2015
3. G. Castiglioni, J.A. Domaradzki, V. Pasquariello, S. Hickel, and M. Grilli. Numerical simulations of separated flows at moderate Reynolds numbers appropriate for turbine blades and unmanned aero vehicles. *Int. J. Heat and Fluid Flow*, 49:91–99, 2014

Proceedings

1. G. Castiglioni, J.R. Bellan, G. Lamanna, and S. Baab. Simulations of high-pressure jet. In *Proceedings of the fourth TRR40 Summer Program, Technische Universität München*, 2017
2. G. Castiglioni, Domaradzki J.A., N. Krais, A. Beck, C.-D. Munz, and F. Schranner. Characterization of numerical dissipation rates in numerical simulations performed using Discontinuous Galerkin methods. In *Proceedings of the third TRR40 Summer Program, Technische Universität München*, 2015
3. G. Castiglioni, Domaradzki J.A., V. Pasquariello, S. Hickel, and M. Grilli. Numerical modeling of 3-D separated flows at Reynolds numbers appropriate for turbine blades and unmanned aero vehicles. In *Proceedings of the second TRR40 Summer Program, Technische Universität München*, pages 177–190, 2013
4. G. Castiglioni, J.A. Domaradzki, M. Grilli, and S. Hickel. Numerical modeling of separated flows at moderate Reynolds numbers appropriate for turbine blades and unmanned aero vehicles. In *Proceedings of the first TRR40 Summer Program, Technische Universität München*, pages 67–76, 2011

Conference proceedings

1. G. Castiglioni and J.R. Bellan. The thermodynamic regime during mixing under high-pressure conditions. In *2018 AIAA Aerospace Sciences Meeting*, page 1188, 2018
2. G. Castiglioni and J.A. Domaradzki. On the evaluation of numerical dissipation rate and viscosity in a commercial code. In *Proceedings of 9th International Symposium on Turbulence and Shear Flow Phenomena (TSFP9)*, 2015
3. F. Cadiuex, G. Castiglioni, J.A. Domaradzki, T. Sayadi, S. Bose, M. Grilli, and S. Hickel. LES of separated flows at moderate Reynolds numbers appropriate for turbine blades and unmanned aero vehicles. In *Proceedings of 8th International Symposium on Turbulence and Shear Flow Phenomena (TSFP8)*, 2013

Conference presentations

1. G. Castiglioni and J.A. Domaradzki. Quantifying numerical dissipation rate in a commercial CFD code. In *Bulletin of the American Physical Society, 67th Annual Meeting of the APS Division of Fluid Dynamics (DFD06)*, volume 59, 2014
2. G. Castiglioni, J.A. Domaradzki, M. Grilli, and S. Hickel. LES of separated flows over an airfoil at moderate Reynolds numbers. In *Bulletin of the American Physical Society, 65th Annual Meeting of the APS Division of Fluid Dynamics (DFD04)*, volume 57, 2012

Awards and patents

- Submitted a patent for novel air vent design (US application number 15060590)
- Visiting research-fellow at SFB-TR40 summer program, Technische Universität München 2011, 2013, and 2017

Skills

- **Programming languages:** Fortran, C, C++, python, Matlab, MPI, openMP, openACC and CUDA
- **Environments:** Linux/Unix OS, MacOS, Windows OS
- **CAD programs:** CATIA, SolidWorks, SolidEdge
- **Commercial CFD:** STAR-CCM+, CFX
- **Commercial FEA:** Abaqus, CosmosWorks