

Alessandro Masullo

EMPLOYMENT

- 06/2021 – Present **Lecturer in Digital Health**
Department of Electrical and Electronic Engineering, University of Bristol, Bristol
- Sensing Technologies for Diagnostics and Monitoring
 - Digital Health Project
 - Students tutoring
- 08/2017 – 06/2021 **Research Associate, SPHERE**
Department of Computer Science, University of Bristol, Bristol
- Investigating the use of Computer Vision algorithms for the detection and analysis of Human Motion aimed at Digital Health Monitoring.
 - Extensively employing Deep Learning and Pattern Recognition techniques to integrate multisensory data for the generation of medically relevant measurements.
 - Designing and developing a novel annotation tool for video monitoring (*MuViLab*, publicly available on GitHub).
- 09/2014 – 08/2017 **Teaching Assistant**
Department of Aerospace Engineering, University of Bristol, Bristol
- Demonstrating laboratories, theoretical classes, marking reports, helping students with coding assignments.
 - Improving my communication skills and ability to exemplify complex concepts.
 - Solve problems under pressure in a quick and efficient manner.
- Modules taught: Computer programming (C, Matlab), Aerospace labs (Fluid Dynamics, Aerodynamics, PIV), Mechanics labs (Engines, Thermodynamics)
- 11/2014 – 05/2017 **Individual Explanatory Project (IXP) mentor**
Department of Aerospace Engineering, University of Bristol, Bristol
- Guiding students during their final year projects, helping them to develop plans and research strategies.
 - Improving my ability to creatively solve problems and communicate with individuals and groups.
- 08/2014 – 09/2015 **Research Assistant**
Department of Aerospace Engineering, University of Bristol, Bristol
- EPSRC-funded project within University of Bristol's Fluid and Aerodynamics Research group to develop CFD meshing techniques applied to experimental image-based measurement algorithms.
 - Enabling me to do research autonomously, presenting and comparing results in a clear and detailed way.

TEACHING

- 08/2020 – 09/2020 **Image Processing and Computer Vision (COMS30030)**
University of Bristol, Bristol
Two lectures designed and presented:
→ Edge detection using image gradients.
→ Shape detection using the Hough Transform.
- 09/2014 – 01/2017 **Experimental Aero Particle Image Velocimetry Lab**
University of Bristol, Bristol
→ Introduction to Particle Image Velocimetry.
→ Theory of Image Analysis for wind speed measurements.
- 02/2015 – 02/2017 **Experiments Fluids 1-2 Lab (AENG11101)**
University of Bristol, Bristol
→ Introduction to Fluid Dynamics.
→ Introduction to drag, lift and pressure measurements.
- 02/2016 – 02/2017 **Combustion Engine Lab (MENG11202)**
University of Bristol, Bristol
→ Working principles of combustion engines.
→ Measurements and evaluation of engines efficiency.
- 02/2016 – 02/2017 **Compressible Flow Lab (AENG21100)**
University of Bristol, Bristol
→ Working principles of a supersonic wind tunnel.
→ Basic flow visualization concepts.
→ Understanding of different types of shockwaves and their behaviour.
- 10/2016 **Thermodynamics Lab (MENG11202)**
University of Bristol, Bristol
→ Functioning of an air cooler system.
→ Introduction to basic temperature and air flow measurements.
- 09/2016 **Introduction to Scientific Computing Lab (AENG11600)**
University of Bristol, Bristol
→ Introduction to C programming language.
→ Fundamentals of programming and MATLAB.
- 02/2016 **Aeronautics and Mechanics MATLAB Lab (AENG11301)**
University of Bristol, Bristol
→ Introduction to aerodynamics.
→ Evaluation of wing performances in MATLAB.

EDUCATION

- 09/2014 – 08/2017 **PhD in Aerospace Engineering (achieved with Faculty of Engineering Commendation)**
University of Bristol, Bristol
- Thesis: *Development of Advanced Algorithms for PIV*
- Developing advanced image processing algorithms to estimate flow velocity through PIV (Particle Image Velocimetry).
 - Experimentally validating novel algorithms with high-speed cameras in the wind tunnel.
 - Statistically analysing and assessing measurement data.
- Skills developed:
- Signal processing, image filtering, background analysis.
 - Motion detection, feature tracking, optical flow.
 - Data statistics, outlier detection, error analysis.
- 02/2012 – 06/2014 **Master's Degree in Aerospace Engineering (110 Lode/110 with Honour Mention)**
Università degli Studi di Napoli Federico II, Naples (Italy)
- Final Dissertation: *"The application of CFD meshing around a rotating cylinder in PIV"*
- 09/2008 – 01/2012 **Bachelor's Degree in Aerospace Engineering (102/110)**
Università degli Studi di Napoli Federico II, Naples (Italy)

AWARDS

- 05/2018 Faculty of Engineering Commendation for PhD degree
- 05/2018 University Research Degree Examinations Board award (nominee)
- 02/2017 Alumni Foundation Conference Travel Award

CODING

- **Python (Expert)**. Used on a daily basis for Machine Learning and Deep Learning.
- **MATLAB (Expert)**. Used to quickly prototype ideas and develop algorithms when performances and platforms involved do not constitute a limitation.
- **C/C++ (Intermediate)**. Mainly used to develop low level mex functions for MATLAB when high performances constitute a limitation in the of an interpreted language.
- **PHP/MYSQL/HTML/CSS/JS (Intermediate)**. Used to develop dynamics websites for research projects and as a hobby.

LANGUAGES

- ENGLISH – Full proficiency
ITALIAN – Native
SPANISH – Basic

VOLUNTEERING

- 03/2017 – 01/2018 **Volunteer**
At-Bristol Science Centre (We The Curious), Bristol
- Working with 8 to 17 year old children, helping out with workshops and laboratories.
 - Allowing me to confront myself with a completely different audience and to gain new skills which are usually far from my field of research.

PUBLICATIONS**Digital Health**

- *Multimodal Classification of Parkinson's Disease in Home Environments with Resiliency to Missing Modalities*
Heidarvinchek F., McConville R., Morgan C., McNaney R., Masullo A., Mirmehdi M., Whone A. L. & Craddock I.
June 2021, Sensors
- *Temporal-Relational CrossTransformers for Few-Shot Action Recognition*
Perrett T. J., Masullo A., Burghardt T., Mirmehdi M. & Damen D.
June 2021, Computer Vision and Pattern Recognition 2021 (CVPR)
- *Data labelling in the wild: annotating free-living activities and Parkinson's disease symptoms*
Morgan C. A. M., Heidarvinchek F., Craddock I., Mcconville R., Perello Nieto M., Tonkin E. L., Masullo A., Vafeas A. T., Kim M., Mcnaney R., Tourte G. J. L. & Whone A. L.
March 2021, Conference on Pervasive Computing and Communications Workshops
- *No Need for a Lab: Towards Multi-Sensory Fusion for Ambient Assisted Living in Real-World Living Homes*
Masullo A., Perrett T., Damen D., Burghardt T. & Mirmehdi M.
February 2021, Conference on Computer Vision Theory and Applications
- *Meta-Learning with Context-Agnostic Initialisations*
Perrett T., Masullo A., Damen D., Burghardt T. & Mirmehdi M.
September 2020, Asian Conference on Computer Vision
- *Person Re-ID by Fusion of Video Silhouettes and Wearable Signals for Home Monitoring Applications*
Masullo A., Burghardt T., Damen D., Perrett T. & Mirmehdi M.
May 2020, Sensors (MDPI)
- *Who Goes There? Exploiting Silhouettes and Wearable Signals for Subject Identification in Multi-Person Environments*
Masullo A., Burghardt T., Damen D., Perrett T. & Mirmehdi M.
October 2019, International Conference on Computer Vision Workshop
- *Sit-to-Stand Analysis in the Wild Using Silhouettes for Longitudinal Health Monitoring*
Masullo A., Burghardt T., Perrett T., Damen D. & Mirmehdi M.
August 2019, Lecture Notes in Computer Science (ICAR).
- *CaloriNet: From silhouettes to calorie estimation in private environments*
Masullo A., Burghardt T., Damen D., Hannuna S., Ponce-López V. & Mirmehdi M.
September 2018, British Machine Vision Conference.
- *Semantically Selective Augmentation for Deep Compact Person Re-Identification*
Ponce-López V., Burghardt T., Hannunna S., Damen D., Masullo A. & Mirmehdi M.
August 2018, European Conference on Computer Vision Workshops.

PhD

- *On dealing with multiple correlation peaks in PIV*
Masullo A. & Theunissen R.
May 2018, Experiments in Fluids

- *Automated mask generation for PIV image analysis based on pixel intensity statistics*
Masullo A. & Theunissen R.
May 2017, Experiments in Fluids
- *On the applicability of numerical image mapping for PIV image analysis near curved interfaces*
Masullo A. & Theunissen R.
Apr 2017, Measurement Science and Technology
- *POD-based Background Removal for Particle Image Velocimetry*
Mendez M. A., Raiola M., Masullo A., Discetti S., Ianiro A., Theunissen R. & Buchlin J-M.
Jan 2017, Experimental Thermal and Fluid Science
- *Improvement of PIV dynamic range in the presence of velocity gradients using multiple correlation peak analysis and self-adaptive windows*
Masullo A. & Theunissen R.
Jul 2016, The International Symposia on Applications of Laser Techniques to Fluid Mechanics
- *Near-wake analysis of perforated disks with varying hole topology*
Theunissen R., Worboys R. & Masullo A.
Jul 2016, The International Symposia on Applications of Laser Techniques to Fluid Mechanics
- *Adaptive vector validation in image velocimetry to minimise the influence of outlier clusters*
Masullo A. & Theunissen R.
Mar 2016, Experiments in Fluids

Research Assistant (Aerospace Engineering)

- *Improvement in universal PIV outlier detection by means of coherence adaptivity*
Masullo A. & Theunissen R.
Sep 2015, 11th International Symposium on Particle Image Velocimetry
- *The feasibility of using CFD meshing in PIV image processing near curvy interfaces*
Masullo A. & Theunissen R.
Sep 2015, 11th International Symposium on Particle Image Velocimetry
- *Improved and robust universal PIV/PTV outlier detection in the presence of clusters*
Masullo A. & Theunissen R.
Jun 2015, 10th Pacific Symposium on Flow Visualization and Image Processing