

Alessandro Masullo

I develop Computer Vision systems for real-world applications. These include Transformer-based Object Detection, Re-Identification models, Multi-Sensory Fusion for behaviour analysis and self-labelling tools for automated annotation. I hold a PhD and have experience across both research and industry.

EMPLOYMENT

- 02/2024 – Present **Sr. Data Scientist in Computer Vision**
Veritone, Inc., Irvine, California, United States (UK remote)
- Led development of state-of-the-art **object detection** and **re-identification** models for person and vehicle ReID (D-FINE, Transformers, Siamese Networks);
 - Led development of a human-in-the-loop **self-labelling** tool for ReID in video data (Topology-Aware Clustering, Self-Supervised Learning, **Vision LLM**)
 - Developed solutions for detection, tracking and localization of cross-domain / cross-view objects in complex real-world scenarios;
 - Contributed to team-wide engineering practices, including code reviews, **Git** flow strategies, and **agile** development to support sustainable machine learning pipelines (ClearML, Bamboo, GitHub).
- 06/2021 – 02/2024 **Lecturer at University of Bristol**
School of Engineering Mathematics and Technology, University of Bristol, Bristol
- Led research on Computer Vision and **Deep Learning** applications in healthcare, managing and mentoring postdoctoral researchers and PhD/MSc students;
 - Developed novel vision-based algorithms for **behaviour analysis** and health monitoring using multi-sensor data (video, wearable, ambient);
 - Taught and coordinated two MSc-level courses in **Digital Health**, simplifying complex technical topics for students from both technical and clinical backgrounds;
 - Collaborated with multidisciplinary teams to deliver industry-facing workshops and research proposals in applied AI;
 - Led the admission process for the MSc in Digital Health, including candidate evaluation, interviews and strategic program development.
- 08/2017 – 06/2021 **Research Associate in Computer Vision, SPHERE Project**
Department of Computer Science, University of Bristol, Bristol
- Developed and deployed a fully autonomous **multi-sensory platform** for health monitoring in residential environment, combining video, wearable and environmental sensors;
 - Designed and implemented Computer Vision algorithms for **human motion analysis** and behaviour recognition in real-world, non-intrusive settings;
 - Applied Deep Learning and Pattern Recognition techniques to estimate **clinically relevant metrics** from video and inertial data;
 - Created and maintained *MuViLab*, a **custom annotation tool** for multi-view video data (publicly available on [GitHub](#), 165+ stars, 37+ forks).

09/2014 – 08/2017 **Teaching Assistant**
Department of Aerospace Engineering, University of Bristol, Bristol

- Delivered laboratory sessions and tutorials across a range of modules, including fluid dynamics, thermodynamics, and computer programming (C, MATLAB);
- Supported students with coding assignments, lab work, and final-year research projects;
- Developed strong communication and teaching skills by simplifying complex engineering concepts and engaging with students;
- Adapted to high-pressure teaching environments, consistently resolving issues efficiently during practical sessions.

Modules taught: Computer programming (C, Matlab), Aerospace labs (Fluid Dynamics, Aerodynamics, PIV), Mechanics labs (Engines, Thermodynamics)

08/2014 – 09/2015 **Research Assistant**
Department of Aerospace Engineering, University of Bristol, Bristol

- Contributed to an EPSRC-funded project within the Fluid and Aerodynamics Research group to develop Computational Fluid Dynamics meshing techniques for image-based measurement algorithms (e.g. Particle Image Velocimetry)
- Conducted independent research, including algorithm development, experimental validation, and quantitative analysis;
- Presented and compared experimental and simulation results in a clear and structured format for academic dissemination.

TEACHING

06/2021 – Present **Sensing Technologies for Diagnostics and Monitoring (EENGM0031)**
University of Bristol, Bristol

- Topics included: Sensor system development, Machine Learning, Wireless medium, Multi-Sensory Fusion, Data reliability.
- Responsibilities: Creating the lectures material, directing the unit, engaging with students, marking/exams.

06/2021 – Present **Digital Health Project (EENGM0035)**
University of Bristol, Bristol

- Topics included: Product development, Quantitative Data Analysis, Regulatory submission, Post market management.
- Responsibilities: Creating the lectures material, supervising and mentoring students, engaging with industry partners, marking/exams.

02/2015 – 02/2017 **Teaching Assistant**
University of Bristol, Bristol

- Units: Experiments Fluids 1-2 Lab (AENG11101), Combustion Engine Lab (MENG11202), Compressible Flow Lab (AENG21100), Thermodynamics Lab (MENG11202), Introduction to Scientific Computing Lab (AENG11600), Aeronautics and Mechanics MATLAB Lab (AENG11301)

- Topics: Fluid Dynamics, working principles of combustion engines, supersonic wind tunnel, Introduction to C programming language, Introduction to aerodynamics.

EDUCATION

09/2014 – 08/2017 **PhD in Image Analysis / 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

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|---------|---|
| 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. Packages used: Keras, TensorFlow, PyTorch, OpenCV, scikit-learn, NumPy, pandas.
- **MATLAB (Expert)**. Used to prototype ideas and develop algorithms during my PhD.
- **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 dynamic websites for research projects and as a hobby.

LANGUAGES

ENGLISH	– Full proficiency
ITALIAN	– Native
SPANISH	– Basic

VOLUNTEERING

12/2023 – Present

Guaranteed Partner Scheme

Redpoint Climbing Centre, Bristol

- Facilitate climbing sessions as part of the Guaranteed Partner Scheme (GPS), supporting inclusive, community-driven climbing for adults of all skill levels

03/2017 – 01/2018

Volunteer

At-Bristol Science Centre (We The Curious), Bristol

- Working with 8 to 17 year old children, helping out with delivering workshops and laboratories.
- This experience challenged me to engage with a completely different audience and develop new communication skills outside my usual domain.

HOBBIES

Climbing, 3D printing, electronic music production, synthesisers, video editing, photography.

PUBLICATIONS

Latest Research

- [Automated Real-World Video Analysis of Sit-to-Stand Transitions Predicts Parkinson's Disease Severity](#)
Morgan C., Masullo A., Mirmehdi M., Isotalus H., Jovan F., McConville R., Tonkin E., Whone A. & Craddock I.
August 2023, Digit Biomark.
- [Toward Enhanced Clinical Decision Support for Patients Undergoing a Hip or Knee Replacement](#)
Grant S., Tonkin E., Craddock I., Blom A., Holmes M., Judge A., Masullo A., Perello Nieto M., Song H., Whitehouse M., Flach P. & Goberman-Hill R.
April 2023, JMIR.
- [Personalized Energy Expenditure Estimation: Visual Sensing Approach With Deep Learning](#)
Perrett T., Masullo A., Damen D., Burghardt T., Craddock I. & Mirmehdi M.
September 2022, JMIR.
- [Inertial Hallucinations - When Wearable Inertial Devices Start Seeing Things](#)
Masullo A., Perrett T., Burghardt T., Damen D. & Mirmehdi M.
May 2022, arXiv.
- [Temporal-Relational CrossTransformers for few-shot action recognition](#)
Perrett T., 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., Heidarvincheh F., Craddock I., McConville R., Perello Nieto M., Tonkin E., Masullo A., Vafeas A., Kim M., McNaney R., Tourte G. & Whone A.

March 2021, International Conference on Pervasive Computing and Communications Workshops (PerCom 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, International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (VISAPP)

- [Multimodal Classification of Parkinson's Disease in Home Environments with Resiliency to Missing Modalities](#)

Heidarivincheh F., McConville R., Morgan C., McNaney R., Masullo A., Mirmehdi M., Whone A. & Craddock A.

January 2021, MDPI Sensors.

- [Meta-Learning with Context-Agnostic Initialisations](#)

Perrett T., Masullo A., Burghardt T., Mirmehdi M. & Damen D.

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.

April 2020, MDPI Sensors.

- [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 (Particle Image Velocimetry)

- [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