Matteo Bustreo, Ph.D.

AI & Data Science Manager | Computer Vision Engineer

Residence: Diamanthof 1
5552 CM, Valkenswaard, Netherland
Phone: +39 349 1583108
E-Mail: matteo.bustreo@gmail.com

Web: www.matteobustreo.com
LinkedIn: it.linkedin.com/in/matteobustreo
GitHub: github.com/matteobustreo

Work Experience

Since Oct 2022

AI Senior Consultant
Deloitte Netherlands
Artificial Intelligence & Data **-** Amsterdam, Netherlands
www.deloitte.com/nl

I support companies in utilizing emerging technologies like Machine Learning and Artificial Intelligence to turn data into actionable insights. I contribute to the enhancement of Deloitte's advanced analytics offerings by providing technical expertise and managing teams while developing Deep Learning solutions for audio, video, and multispectral images.

Apr 2018 – Oct 2022

AI & Data Science Manager
Istituto Italiano di Tecnologia
PAVIS (Artificial Intelligence and Computer Vision Department) **-** Genova, Italy
www.iit.it/pavis.html

I am the person in charge of coordinating and managing the design and the execution of the Artificial Intelligence and Data Science projects in the Computer Vision and AI research line (PAVIS) of the Italian Institute of Technology (IIT).

Reporting directly to the Head of the Research Line, I collaborate with both commercial and institutional partners to translate their needs into achievable tasks and oversee the development team, project implementation, delivery of prototypes, and execution of pilot installations. My area of focus includes Industry 4.0, Sustainability, AI for Good, Digital Healthcare, Cultural Heritage Preservation, and Retail Analytics.

RELEVANT PROJECTS:

- **Design of an IoT-powered monitoring system for geriatric healthcare**
  State of the Art survey, technical requirement definition, pilot setup installation and software architecture design for the development of a smart environment able to continuous remote monitoring of elderly people. In collaboration with Geova city's hospital, SME and principal stakeholder of the project.
- **Interpersonal distance estimation from uncalibrated RGB cameras**:
  Requirement gathering, design and development of an AI-based solution for real-time evaluation of social distancing in retail settings to quickly manage crowded situations during pandemics. Management of a team of 4, and successful deployment of prototypes at Genova Airport and Genova IperCoop Shopping Mall.
- **Automatic analysis of shoppers' movements in retailer shops**
  Lead the design and implementation of a 24/7 person detection and tracking system to measure customer and advertising engagement. Agile project management for updating the requirements based on the stakeholders' feedbacks and the change in business opportunities. Prototyped and tested in a major home improvement store in Milan.
- **Leadership detection**
  Design and development of an algorithm for identifying emerging leaders in meetings through facial landmarks and head pose estimation, working with a cross-functional team of engineers and psychologists.
- **Industrial quality inspection**
  Drive the requirements collection, feasibility study, and proof of concept development of industrial quality inspection systems.

Jan 2011 – Apr 2018	Senior Computer Vision & Machine Learning Engineer **Istituto Italiano di Tecnologia** PAVIS (Artificial Intelligence and Computer Vision Department) **-** Genova, Italy www.iit.it/pavis.html I am involved in the research activities of the Computer Vision and AI research line (PAVIS), of the Italian Institute of Technology (IIT), providing expertise and technical participation in projects and real-time demo development. I investigate and test emerging tech opportunities, utilizing state-of-the-art tools such as RGBD and PTZ cameras, microphone arrays, thermal cameras, eye-tracking systems and motion capture systems. From 2013 to 2016, I designed and led the Technology Transfer activity ViBe, finalist at Smart Cup Liguria 2013.
Sep 2008 – Jan 2011	Software Engineer – *Computer Vision Specialist* **Microtec GmbH** - Bressanone, Italy www.microtec.eu Design of prototypical hardware/software solutions, development and commissioning of machine vision systems for wood visual quality evaluation, strength analysis, and knot detection using multiple calibrated RGB cameras, laser emitters, and X-ray sensors.

Coordinated Projects

I have notable experience in the preparation, technical supervision, coordination and management of industrial projects funded by public and private organizations. The following is a list of some of the the most recent ones:

- **2018-2022** - Joint Laboratory between IIT and Camozzi Group titled "*Digital Textile*" - Budget: 331 k€;
- **2021** - Industry-funded project titled "*Design and developement of a system for retail shop out of stock detection*" - Budget: 95 k€;
- **2020** - IIT-funded project titled "*Social distancing estimation from Uncalibrated Single Images*";
- **2019-2020** - Industry-funded project titled "*Activity detection and Violence Recognition from Video Surveillance camera in the wild*" - Budget: 196 k€;
- **2018-2019** - Industry-funded project titled "*Visual Inspection of glasses for the automatic detection and classification of defects by Machine Learning*" - Budget: 281 k€;
- **2017** - Industry-funded project titled "*Feasibility Study for the Visual Inspection and Assessment of Refractory Tiles in Turbin Combustion Chambers*". Budget: 120 k€. Follow-up: 2018-2020 (2 years). Budget: 911 k€.

Patent

Italian Patent Deposit n. 102020000027360, submitted in Nov 16th, 2020:
"Apparato e metodo per la rilevazione in continuo di difetti in un filo in un filatoio"
(System and method for the continuous search of yarn defects in a spinning machine)
by Giavarini Matteo, Assenza Rosario, Ghilardi Renato, Brescianini Luca, Haleem Noman, Bustreo Matteo, Del Bue Alessio

Other Work Experience

Sep 2021 – Nov 2021	AI Team Lead **FruitPunch –** www.fruitpunch.ai
Feb 2020 – Apr 2020	Lead Machine Learning Engineer **Omdena -** www.omdena.com
Oct 2014 – Jul 2015	Lecturer - *Mobile CV and wearable technologies for high-tech Sardinian companies* **Università di Cagliari**
Oct 2008 – Dec 2010	Computer Science Teacher - *Secondary School - "Terza Area" Didactic Project* **I.P.S.S.C.T. Cesare Musatti -** Dolo, Venice, Italy
Jan 2008 – Aug 2008	Subsea Control Engineer **Tecnomare SpA - Eni Group** - Venice, Italy
May 2006 – Oct 2008	Website Designer **3F Security** - Dolo, Venice, Italy

Education

Nov 2017 – Mar 2021	**PhD Degree in Machine Learning, Computer Vision and Recognition** **Università degli Studi di Genova – IIT** Thesis: Coping with Data Scarcity in Deep Learning and Applications for Social Good Advisor: Prof. Vittorio Murino
Mar 2007 – Sep 2007	Visiting Student at **UCLA Vision Lab** - Los Angeles, CA, USA
Jan 2005 – Dec 2007	Master Degree in Automatic Control Engineering - **Università degli Studi di Padova** Thesis: Action Recognition Using Dynamic Time Warping Under Dynamic Constraints. Advisor: Prof. Maria Elena Valcher Co-Advisor: Prof. Stefano Soatto (UCLA)
Sep 2002 – Dec 2004	Bachelor Degree in Information Engineering - **Università degli Studi di Padova** Thesis: Modelli di diffusione delle popolazioni (*Modelling biological population in space and in time*). Advisor: Prof. Giovanni Marchesini

Online Attended Courses

- *Foundations of Project Management (*Coursera Specialization) in 2021;
- *Generative Adversarial Networks (GANs) (*Coursera Specialization) in 2021;
- *Deep Learning Specialization (*Coursera Specialization) in 2020;
- *Advanced Data Science with IBM (*Coursera Specialization) in 2019;
- *Convolutional Neural Networks for Visual Recognition* by Fei Fei Li (Stanford University) in 2016;
- *Machine Learning* by Andrew Ng (Stanford University) in 2015;
- *Private Equity and Venture Capital* by Stefano Caselli (Universitá Bocconi) in 2015;
- *Computer Vision: The Fundamentals* by Jitendra Malik (University of California, Berkeley) in 2014.

Attended Courses

In 2016 I attended a 2 days course held by EPFL Professors Christopher Tucci and Lorenzo Massa:
- *Strategy, Technology and Innovation Management (STIM) Workshop*

I attended 4 editions of the annual Summer School for PhD Students organized by IIT PAVIS Department, with the participation of top level international speakers:
- *Scene Understanding and Object Recognition in Context* by A. Torralba (MIT) in 2014;
- *Large Scale Visual Recognition of Object Instances and Categories* by A. Zisserman and A. Vedaldi (Oxford University) in 2013;
- *Component Analysis methods for Human Sensing* by F. De la Torre (Carnegie Mellon University) and J. Cohn (Pittsburgh University) in 2012;
- *2D and 3D Visual Recognition: Approaches and Methods* by Fei Fei Li (Stanford University) and S. Savarese (Michigan University) in 2011.

Organized Local and International Events

I have been part of the Organization Committee of the following events:
- 19th International Conference on Image Analysis and Processing (ICIAP2015)
- 2nd, 3rd, 4th, 5th PAVIS School on Computer Vision, Pattern Recognition, and Image Processing (2011-12-13-14)

I have developed demo solutions exposed on the following events:
- Festival della Scienza 2015, 2016, 2017 (*Genova*);
- Salone del Libro 2016 (*Torino*).

Publications

- A. Petrushin, M. Freddolini, G. Barresi, M. Bustreo, M. Laffranchi, A. Del Bue, L. De Michieli - *"IoT-Powered Monitoring Systems for Geriatric Healthcare: Overview" - Internet of Things for Human-Centered Design, 2022*
- M. Moglianetti, D. Pedone, P. Morerio, A. Scarsi, P. Donati, M. Bustreo, A. Del Bue, P. P. Pompa - *"Nanocatalyst-enabled physically unclonable functions as smart anticounterfeiting tags with AI-aided smartphone authentication" - ACS Applied Materials & Interfaces, 2022*
- D. Kossyvaki, A. Barbetta, M. Contardi, M. Bustreo, K. Dziza, S. Lauciello, A. Athanassiou, D. Fragouli – *"Highly porous curcumin-loaded polymer mats for rapid detection of volatile amines" - ACS Applied Polymer Materials, 2022 (In Press)*
- N. Haleem, M. Bustreo, A. Del Bue – *"A computer vision based online quality control system for textile yarns" - Computers in Industry, 2021*

- P. Morerio, M. Bustreo, Y. Wang, A. Del Bue – "*End-to-end pairwise human proxemics from uncalibrated single images*" - *International Conference on Image Processing (ICIP2021)*
- J. Zia, G. Mancini G., M. Bustreo, A. Zych, R. Donno, A. Athanassiou, D. Fragouli – "*Porous pH natural indicators for acidic and basic vapor sensing*" - *Chemical Engineering Journal, 2021*
- A. Hati, M. Bustreo, D. Sona, V. Murino, A. Del Bue - "*Weakly Supervised Geodesic Segmentation of Egyptian Mummy CT Scans*" - *International Conference on Pattern Recognition (ICPR2020)*
- M. Aghaei, M. Bustreo, Y. Wang, G. L. Bailo, P. Morerio, A. Del Bue – "*Single Image Human Proxemics Estimation for Visual Social Distancing*" - *Winter Conference on Applications of Computer Vision (WACV 2020)*
- C. Beyan, M. Bustreo, M. Shahid, G. L. Bailo, N. Carissimi, A. Del Bue "*Analysis of Face-Touching Behavior in Large Scale Social Interaction Dataset*" – *ACM International Conference on Multimodal Interaction (ICMI 2020)*
- M. Bustreo, J. Cavazza, V. Murino – "*Enhancing Visual Embeddings through Weakly Supervised Captioning for Zero-Shot Learning*" - *IEEE International Conference on Computer Vision Workshops (ICCVw), 1st International Workshop on Multi-Discipline Approach for Learning Concepts - Zero-Shot, One-Shot, Few-Shot and Beyond 2019*
- J. Zia, G. Mancini, M. Bustreo, A. Zych, R. Donno, A. Athanassiou, D. Fragouli - "*Porous pH natural indicators for acidic and basic vapor sensing*" - *Chemical Engineering Journal, 2020, 126373*
- *C. Beltrán-González, M. Bustreo, A. Del Bue* - "*External and internal quality inspection of aerospace components*" - *IEEE 7th International Workshop on Metrology for AeroSpace, (MetroAeroSpace 2020)*
- M. Aghaei, M. Bustreo, P. Morerio, N. Carissimi, A. Del Bue, V. Murino - "*Complex-Object Visual Inspection via Multiple Lighting Configurations*" - *International Conference on Pattern Recognition (ICPR2020)*
- M.E. Genovese, G. Caputo, G. Nanni, C. Setti, M. Bustreo, G. Perotto, A. Athanassiou, D. Fragouli – "*Light Responsive Silk Nanofibers: An Optochemical Platform for Environmental Applications*" - *ACS Applied Materials & Interfaces 2017 9 (46), 40707-40715*
- C. Beyan, N. Carissimi, S. Vascon, M. Bustreo, F. Capozzi, A. Pierro, C. Becchio, V. Murino - "*Detecting emergent leader in a meeting environment using nonverbal visual features only*" - *International Conference on Multimodal Interaction (ICMI 2016)*
- M. Crocco, A. Del Bue, M. Bustreo, V. Murino - "A Closed Form Solution to the Microphone Position Self-Calibration Problem" - *International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2012)*
- M. Raptis, M. Bustreo, S. Soatto - "Time Warping Under Dynamic Constraints with Application to Non-Stationary Action Alignment and Classification" - *International Workshop on Dynamical Vision* (ICCV 2007)

Technical Skills, Libraries and SDKs

Application Development

Good	*Python, C++, Matlab*
Basic	*C, PHP, Java, Javascript*

Development

Proficient	*Visual Studio, VS Code*
Basic	*Spyder, Eclipse, PyCharm*

Development OS

Proficient	*Windows, Linux*

Virtualization Tools

Good	*Docker*

Computer Vision Libraries

Proficient	*OpenCV*

Machine Learning Libraries

Good	*PyTorch, Tensorflow, Keras, Lightning*

Point Cloud & 3D Data Libraries

Basic	*Microsoft Kinect SDK, Freenect2, Point Cloud Library*

Other C++ Libraries

Basic/Good	*C++STL, Qt, Boost*

Motion Capture Systems

Basic	*Vicon Nexus*

Eye Tracking System

Basic	*SMI Begaze, SMI Experiment Suite 360°*

Language Skills

Italian: Mother tongue
English: Proficient

Soft Skills and Interests

Skills: Problem-solving; Project management; Leadership; Strategic thinking; Managing stakeholders and multi-cultural teams; Multidisciplinary teamwork; Proactive approach; Motivational; Lateral thinking.

Sport: I am one of the founders and the vice-president of Genova Ultimate Disc Association, which currently counts 45 members. I am 1st and 2st level federal coach of the Italian Flying Disc Federation (FIFD). I am playing Ultimate Italian National Championship since 7 years ago, I played rugby for 11 years (National A Championship U21) and I played soccer for 5 years.

Music: I played violin for 3 years and I have been playing guitar since I was a kid.

Travels: I visited Australia, Austria, Croatia, Cuba, England, Ecuador, France, Germany, Greece, England, Hungary, India, Indonesia, Kenya, Netherlands, Norway, Perù, Scotland, Slovenia, Spain, Switzerland, Tanzania, Turkey, United States.