

# Raffaella Lanzarotti

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## EDUCATION

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### PhD in Computer Science

University of Milan

November 2003

### Bachelor of Computer Science

University of Milan

December 1999

## PROFESSIONAL AFFILIATION

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2004-present: **Assistant professor** (Ricercatore Confermato INF/01) at the Department of Computer Science, University of Milan, Italy.

## LANGUAGE SKILLS

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Mother-tongue: Italian.

Fluent in: English and French.

## RESEARCH PROJECTS AND GRANTS

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### Project Coordinator.....

- **Stairway to elders: bridging space, time and emotions in their social environment for wellbeing**
  - Bando "Ricerca Sociale sull'invecchiamento: persone, luoghi e relazioni". A.Y. 2019 - 2021
  - National research project founded by Fondazione Cariplo. (budget for the project: € 200.000. Budget for the unit: € 90.000)
  - Principal Investigator of the project
- **Interpreting emotions: a computational tool integrating facial expressions and biosignals based shape analysis and Bayesian networks**
  - FIRB - Future in Research Fund. A.Y. 2012 - 2016
  - National research project founded by MIUR - Ministero dell'Istruzione e della Ricerca. (budget for the unit: € 291.237)
  - Scientific Coordinator for the Università degli Studi di Milano unit

### Project Participant.....

- **Individuazione e riconoscimento di volti ed espressioni mediante misure di similarità**
  - PRIN - Progetti di Rilevante Interesse Nazionale. A.Y. 2006-2008
  - National research project founded by MIUR - Ministero dell'Istruzione e della Ricerca.
  - Scientific coordinator: prof. Marcello Pelillo
- **Tecniche innovative di clustering nella segmentazione delle immagini biomediche**
  - PRIN - Progetti di Rilevante Interesse Nazionale. A.Y. 2004-2005
  - National research project founded by MIUR - Ministero dell'Istruzione e della Ricerca.
  - Scientific coordinator: prof. Nicola De Luca
- **Acquisizione e Compressione di Range Data e Tecniche di Modellazione 3D di Volti da Immagini**

- PRIN - Progetti di Rilevante Interesse Nazionale. A.Y. 2003-2004
- National research project founded by MIUR - Ministero dell'Istruzione e della Ricerca.
- Scientific coordinator: prof. Vittorio Murino

## AWARDS

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- o IAPR Best Paper Award at the International Conference on Image Analysis and Processing (ICIAP, 2017) accorded for the paper "Virtual EMG via facial video analysis"
- o Best Paper Award of the Journal of Applied Clinical Medical Physics (JACMP, 2017) accorded to the paper "Sum signal dosimetry: a new approach for high dose quality assurance with Gafchromic EBT3" by the American Association of Physicists in Medicine (AAPM)

## TEACHING ACTIVITIES

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- o **Image Processing**, bachelor degree in Computer Science and Communication - Università degli Studi di Milano. Years 2011/2012-present.
- o **Multimedia Information**, bachelor degree in Computer Science and Communication - Università degli Studi di Milano. Years 2017/2018-present.
- o **Computer Vision**, master degree in Computer Science - Università degli Studi di Milano. A.Y. 2018/2019-present

## PROFESSIONAL SERVICE

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### TECHNICAL PROGRAM COMMITTEE MEMBER.....

- o 2013, 2014, 2015: Member of the scientific Committee of ICPRAM
- o 2016-present: Review editor for the journal "Robot and Machine Vision" of Frontiers in ICT.
- o 2019-2021: Guest editor for the journal IEEE Transactions on Emerging Topics in Computing. Special Section on Assistive Computing Technologies for Human Well-Being.
- o 2019: Chair of the track "Video Processing for Human Behavioral Analysis (VP-HBA)" in the conference "ACM Symposium on Applied Computing (SAC 2020)"

### EXTERNAL REVIEWER.....

- o Referee for the journals:
  - IEEE Trans. of Image Processing
  - Computer Vision and Image Understanding- Elsevier
  - Signal Processing: Image Communication-Elsevier
  - Pattern Recognition – Elsevier
  - IET Computer Vision
  - Vision Systems Theory, Tools and Applications - Frontiers
  - Sensors - MDPI
  - Symmetry -MDPI
- o Referee for the conferences:
  - International Conference on Pattern Recognition Applications and Methods (ICPRAM)
  - International Conference on Image Analysis and Processing (ICIAP)

### PROFESSIONAL CONSULTATIONS.....

- o Design and implementation of a software for the face recognition acquired in uncontrolled conditions. Customer: Raggruppamento Carabinieri Investigazioni Scientifiche (RIS), Dr. A. Mattei

- (years 2009 -2012)
- Design and implementation of a software for medical image processing. Customer: Istituto Neurologico C. Besta di Milano, prof.ssa M.L. Fumagalli. (years 2014-present)
  - Modeling of a solution for monitoring vineyard with drones. Customer: GreenSharp S.r.l. Dr. A. Guarneri (year 2018)

## PROFESSIONAL AFFILIATIONS

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- Member of the International Association for Pattern Recognition (IAPR)
- Member of the Italian Association for the Research in Computer Vision, Pattern Recognition and Machine Learning (CVPL)

## PUBLICATIONS

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- [1] Sathya Bursic, Alessandro D'Amelio, Marco Granato, Giuliano Grossi, and Raffaella Lanzarotti. "A Quantitative Evaluation Framework of Video De-Identification Methods". In: *2020 25th International Conference on Pattern Recognition (ICPR)*. IEEE. 2021, pp. 6089–6095.
- [2] Donatello Conte, Giuliano Grossi, Raffaella Lanzarotti, Jianyi Lin, and Alessandro Petrini. "Analysis of a parallel MCMC algorithm for graph coloring with nearly uniform balancing". In: *Pattern Recognition Letters* (2021).
- [3] Giuseppe Boccignone, Donatello Conte, Vittorio Cuculo, Alessandro D'Amelio, Giuliano Grossi, and Raffaella Lanzarotti. "An Open Framework for Remote-PPG Methods and Their Assessment". In: *IEEE Access* 8 (2020), pp. 216083–216103.
- [4] Giuseppe Boccignone, Vittorio Cuculo, Alessandro D'Amelio, Giuliano Grossi, and Raffaella Lanzarotti. "On gaze deployment to audio-visual cues of social interactions". In: *IEEE Access* 8 (2020), pp. 161630–161654.
- [5] Giuseppe Boccignone, Claudio de'Sperati, Marco Granato, Giuliano Grossi, Raffaella Lanzarotti, Nicoletta Noceti, and Francesca Odone. "Stairway to Elders: Bridging Space, Time and Emotions in Their Social Environment for Wellbeing." In: *ICPRAM*. 2020, pp. 548–554.
- [6] Sathya Bursic, Giuseppe Boccignone, Alfio Ferrara, Alessandro D'Amelio, and Raffaella Lanzarotti. "Improving the accuracy of automatic facial expression recognition in speaking subjects with deep learning". In: *Applied Sciences* 10.11 (2020), p. 4002.
- [7] Giuliano Grossi, Raffaella Lanzarotti, Paolo Napoletano, Nicoletta Noceti, and Francesca Odone. "Positive technology for elderly well-being: A review". In: *Pattern Recognition Letters* 137 (2020), pp. 61–70.
- [8] Giuseppe Boccignone, Vittorio Cuculo, Alessandro D'Amelio, and Raffaella Lanzarotti. "Social traits from stochastic paths in the core affect space". In: *Proceedings of the 13th EAI International Conference on Pervasive Computing Technologies for Healthcare*. 2019, pp. 314–319.
- [9] Donatello Conte, Giuliano Grossi, Raffaella Lanzarotti, Jianyi Lin, and Alessandro Petrini. "A parallel MCMC algorithm for the Balanced Graph Coloring problem". In: *International Workshop on Graph-Based Representations in Pattern Recognition*. Springer. 2019, pp. 161–171.
- [10] Vittorio Cuculo, Alessandro D'Amelio, Giuliano Grossi, and Raffaella Lanzarotti. "Worldly eyes on video: learnt vs. reactive deployment of attention to dynamic stimuli". In: *International Conference on Image Analysis and Processing*. Springer. 2019, pp. 128–138.
- [11] Vittorio Cuculo, Alessandro D'Amelio, Giuliano Grossi, Raffaella Lanzarotti, and Jianyi Lin. "Robust Single-Sample Face Recognition by Sparsity-Driven Sub-Dictionary Learning Using Deep Features". In: *Sensors* 19.1 (2019). doi: 10.3390/s19010146.

- [12] Giuseppe Boccignone, Donatello Conte, Vittorio Cuculo, Alessandro D'Amelio, Giuliano Grossi, and Raffaella Lanzarotti. "Deep Construction of an Affective Latent Space via Multimodal Enactment". In: *IEEE Trans. Cognitive and Developmental Systems* 10.4 (2018), pp. 865–880. doi: 10.1109/TCDS.2017.2788820.
- [13] Giuseppe Boccignone, Vittorio Cuculo, Alessandro D'Amelio, Giuliano Grossi, and Raffaella Lanzarotti. "Give Ear to My Face: Modelling Multimodal Attention to Social Interactions". In: *Computer Vision – ECCV 2018 Workshops*. Ed. by Jacques Blanc-Talon, Wilfried Helbert David and Philips, Dan Popescu, and Paul Scheunders. Springer International Publishing, 2018, pp. 331–345.
- [14] Matteo Bodini, Alessandro D'Amelio, Giuliano Grossi, Raffaella Lanzarotti, and Jianyi Lin. "Single Sample Face Recognition by Sparse Recovery of Deep-Learned LDA Features". In: *Advanced Concepts for Intelligent Vision Systems*. Ed. by Jacques Blanc-Talon, Wilfried Helbert David and Philips, Dan Popescu, and Paul Scheunders. Springer International Publishing, 2018, pp. 297–308. doi: 10.1007/978-3-030-01449-0\_25.
- [15] Vittorio Cuculo, Alessandro D'Amelio, and Raffaella Lanzarotti and Giuseppe Boccignone. "Personality Gaze Patterns Unveiled via Automatic Relevance Determination". In: *Software Technologies: Applications and Foundations - STAF 2018*. Ed. by Manuel Mazzara, Iulian Ober, and Gwen Salaün. Vol. 11176. Lecture Notes in Computer Science. Springer, 2018, pp. 171–184.
- [16] Alessandro Adamo, Giuliano Grossi, Raffaella Lanzarotti, and Jianyi Lin. "Sparse decomposition by iterating Lipschitzian-type mappings". In: *Theor. Comput. Sci.* 664 (2017), pp. 12–28. doi: 10.1016/j.tcs.2016.04.025.
- [17] Giuseppe Boccignone, Donatello Conte, Vittorio Cuculo, and Raffaella Lanzarotti. "AMHUSE: a multimodal dataset for HUMour Sensing". In: *Proceedings of the 19th ACM International Conference on Multimodal Interaction, ICMI 2017*. Ed. by Edward Lank, Alessandro Vinciarelli, Eve E. Hoggan, Sriram Subramanian, and Stephen A. Brewster. ACM, 2017, pp. 438–445.
- [18] Giuseppe Boccignone, Vittorio Cuculo, Giuliano Grossi, Raffaella Lanzarotti, and Raffaella Migliaccio. "Virtual EMG via Facial Video Analysis". In: *Image Analysis and Processing (ICIAP 2017)*. Ed. by Sebastiano Battiato, Giovanni Gallo, Raimondo Schettini, and Filippo Stanco. Springer International Publishing, 2017, pp. 197–207.
- [19] Claudio Ceruti, Vittorio Cuculo, Alessandro D'Amelio, Giuliano Grossi, and Raffaella Lanzarotti. "Taking the Hidden Route: Deep Mapping of Affect via 3D Neural Networks". In: *New Trends in Image Analysis and Processing (ICIAP 2017)*. Ed. by Sebastiano Battiato, Marco Farinella Giovanni Maria and Leo, and Giovanni Gallo. Springer International Publishing, 2017, pp. 189–196.
- [20] Davide Cusumano, Maria Luisa Fumagalli, Francesco Ghielmetti, Linda Rossi, Giuliano Grossi, Raffaella Lanzarotti, Laura Fariselli, and Elena De Martin. "Sum signal dosimetry: A new approach for high dose quality assurance with Gafchromic EBT3". In: *Journal of Applied Clinical Medical Physics* (2017). doi: 10.1002/acm2.12045.
- [21] Alessandro D'Amelio, Vittorio Cuculo, Giuliano Grossi, Raffaella Lanzarotti, and Jianyi Lin. "A Note on Modelling a Somatic Motor Space for Affective Facial Expressions". In: *New Trends in Image Analysis and Processing (ICIAP 2017)*. Ed. by Sebastiano Battiato, Giovanni Maria Farinella, Marco Leo, and Giovanni Gallo. Springer International Publishing, 2017, pp. 181–188.
- [22] Giuliano Grossi, Raffaella Lanzarotti, and Jianyi Lin. "Orthogonal Procrustes Analysis for Dictionary Learning in Sparse Linear Representation". In: *PLOS ONE* 12.1 (2017), pp. 1–16. doi: 10.1371/journal.pone.0169663.
- [23] Giuliano Grossi, Raffaella Lanzarotti, and Jianyi Lin. "Robust Face Recognition Providing the Identity and Its Reliability Degree Combining Sparse Representation and Multiple Features". In: *IJPRAI* 30.10 (2016), pp. 1–18. doi: 10.1142/S0218001416560073.

- [24] Alessandro Adamo, Giuliano Grossi, Raffaella Lanzarotti, and Jianyi Lin. "ECG compression retaining the best natural basis k-coefficients via sparse decomposition". In: *Biomed. Signal Proc. and Control* 15 (2015), pp. 11–17. doi: 10.1016/j.bspc.2014.09.002.
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- [28] Giuliano Grossi, Raffaella Lanzarotti, and Jianyi Lin. "High-rate compression of ECG signals by an accuracy-driven sparsity model relying on natural basis". In: *Digital Signal Processing* 45 (2015), pp. 96–106. doi: 10.1016/j.dsp.2015.06.006.
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- [30] Alessandro Adamo, Giuliano Grossi, and Raffaella Lanzarotti. "Face Recognition in Uncontrolled Conditions Using Sparse Representation and Local Features". In: *Image Analysis and Processing - ICIAP 2013*. Ed. by Alfredo Petrosino. Vol. 8157. Lecture Notes in Computer Science. Springer, 2013, pp. 31–40.
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- [41] Paola Campadelli, Raffaella Lanzarotti, and Giuseppe Lipori. "Face Localization in Color Images with Complex Background". In: *Seventh International Workshop on Computer Architectures for Machine Perception (CAMP 2005)*. IEEE, 2005, pp. 243–248.
- [42] Paola Campadelli, Raffaella Lanzarotti, Giuseppe Lipori, and Eleonora Salvi. "Face and Facial Feature Localization". In: *Image Analysis and Processing - ICIAP 2005*. Ed. by Fabio Roli and Sergio Vitulano. Vol. 3617. Lecture Notes in Computer Science. Springer, 2005, pp. 1002–1009.
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- [47] Paola Campadelli, Raffaella Lanzarotti, and C. Savazzi. "A feature-based face recognition system". In: *12th International Conference on Image Analysis and Processing (ICIAP 2003)*. IEEE Computer Society, 2003, pp. 68–73.
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- [52] Raffaella Lanzarotti, Paola Campadelli, and N. Alberto Borghese. "Automatic Features Detection for Overlapping Face Images on their 3D Range Models". In: *11th International Conference on Image Analysis and Processing (ICIAP 2001)*. IEEE Computer Society, 2001, pp. 316–321.
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