Lorenzo Baraldi

Curriculum Vitae

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Education

2017 **Research Intern**, *Facebook Artificial Intelligence Reasearch (FAIR), Paris*.
Research topics: Temporal Video alignment, Video Classification
Supervisors: Hervé Jégou and Matthijs Douze

2014–on going **PhD Student**, *University of Modena and Reggio Emilia, Italy*.
Admitted to the third year of Phd Curriculum in Computer Engineering of the International Phd School in ICT
Research topics: Multimedia technologies for video analysis, tagging, retrieval and accessing
Supervisor: Prof. Rita Cucchiara

2012–2014 **Master Degree in Computer Engineering**, *University of Modena and Reggio Emilia, Italy*.
Mark: 110/110 cum laude
Thesis title: "Hand Segmentation and Gesture Recognition in Ego-centric Videos"
Supervisors: Prof. Rita Cucchiara, Dr. Giuseppe Serra
Abstract: The thesis explores and proposes state-of-the-art computer vision and pattern recognition techniques for hand segmentation and gesture recognition in egocentric vision. The proposed algortihms are tested on prototype wearable sensors. This work has been published in [3, 11, 12].

2008–2011 **Bachelor Degree in Computer Engineering**, *University of Modena and Reggio Emilia, Italy*.
Mark: 110/110 cum laude
Thesis title: "Dimensionality reduction techniques for Web datasets: PCA vs SVD"
Supervisor: Dr. Riccardo Lancellotti

2003–2008 **Scientific High School Diploma**, *Scientific High School "A. Tassoni"*, Modena, Italy.
Mark: 100/100 cum laude

Languages

Italian **Mothertongue**

English **Council of Europe Level B2 – Cambridge ESOL Certificate**

French **Basic**

Computer skills

Programming languages	C, C++, Matlab, Python, Java, Javascript, CUDA, HTML
Databases	SQL, Microsoft SQL Server
Libraries	OpenCV, Caffe, Theano, Keras, PyTorch

Research activities

May - December 2014	*Egocentric Vision and Gesture Recognition from wearable cameras* – Development of state-of-the-art computer vision and pattern recognition techniques for hand segmentation and gesture recognition in egocentric vision, suitable for low power wearable sensors [3, 11, 12].
December 2014 - September 2016	*Temporal Video Segmentation and Retrieval* – Research on multimedia technologies for video parsing and understanding. Devlopment of algorithms for semantic temporal video segmentation and for fine-grained search inside videos and the re-use of video parts [5, 2, 4, 6, 13, 14, 15, 16].
October 2016 - on going	*Saliency prediction* – Research on Deep Learning architectures for gaze prediction on images [8, 17, 7].
September 2016 - on going	*Video Captioning, tagging and segmentation* – Research on Deep Learning architectures for video captioning, to automatically generate descriptions for broadcast and user-generated videos [1].

Research Interests

- Computer Vision
- Image Processing
- Pattern Recognition and Machine Learning
- Deep Learning
- Multimedia

Conferences and tutorials attended

2017	International Conference on Computer Vision - ICCV, Venice
	International Workshop on Content-Based Multimedia Indexing - CBMI, Florence
	13th Italian Research Conference on Digital Libraries - IRCDL, Modena
2016	International Conference on Pattern Recognition - ICPR, Cancun (Mexico)
	ACM Multimedia - Amsterdam
	European Conference on Computer Vision - ECCV, Amsterdam
	International VISMAC Summer School - Grado
	ACM International Conference on Multimedia Retrieval - ICMR, New York
	12th Italian Research Conference on Digital Libraries - IRCDL, Firenze
2015	11th Italian Research Conference on Digital Libraries - IRCDL, Bolzano
	7th Iberian Conference on Pattern Recognition and Image Analysis - IbPRIA, Santiago de Compostela

International Conference on Multimedia and Expo - ICME, Torino

International Computer Vision Summer School - ICVSS, Sicily

2014 "Second Short Spring School on Surveillance" – S5

Seminars attended

2017 Doctoral Consortium at ICCV 2017 - Mentor: Prof. Trevor Darrell

2016 "Hidden Markov Models and Selected Applications" – Prof. Jon Ander Gomez Adrian (UPV) – Modena, October 24-26

"Faces, deep learning and the pursuit of training data" – Prof. Tal Hassner (Open University of Israel) – Modena, May 17

2015 "Computer Graphics and 3D Reconstruction" – Prof. Nadia Magnenat Thalmann (Director of the Institute for Media Innovation in Singapore) and Prof. Daniel Thalmann – Modena, September 24-26

"Innovation, Inspiration and Vision" – Prof. Arnold Smeulders - Professor at the University of Amsterdam, Director of COMMIT, Founder of EuVision – Modena, June 15

"A Vision for the Future of Computer Science & Engineering and Higher Education" – Dr. James C. Spohrer (Leader of IBM's Cognitive Systems Institute Group) – Modena, June 8

"Insights from Big Data: Interaction, Design and Innovation" – Dr. Alejandro Jaimes – Modena, April 16

"Diffusion of Information in Social Media" – Prof. William Rand, University of Maryland – Modena, November 23-25

"Academic English Workshop I" – Dott. Silvia Cavalieri – Modena, November 6-10

"Academic English Workshop II" – Dott. Silvia Cavalieri – Modena, October 8-20

2014 "Introduction to Machine Learning and Online Learning" – Prof. Roberto Paredes – Modena, November 26-28

"Active Contours in Image Processing and Computer Vision" – Prof. Anthony Yezzi – Modena, October 16

"Second Short Spring School on Surveillance" – Modena, May 7-9

"Egocentric Recognition of Objects and Activities" – Prof. James M. Rehg – Modena, April 30

Grants

2017 (Within the Imagelab group at Unimore) Italian Supercomputing Resource Allocation (ISCRA) Grant from CINECA, for accessing the Galileo HPC Platform.

2016 (Within the Imagelab group at Unimore) Facebook AI Partnership, with the donation of 8 NVIDIA Tesla P100 GPUs.

(Within the Imagelab group at Unimore) NVIDIA Hardware Grant, with the donation of one Tesla K40 GPU

(Within the Imagelab group at Unimore) Italian Supercomputing Resource Allocation (ISCRA) Grant from CINECA, for accessing the Galileo HPC Platform.

Teaching activities

2017 Laboratory lecturer for the Computer Vision graduate course, Prof. Cucchiara, at University of Modena and Reggio Emilia

Tutor for the Fundamentals of Computer Science I undergraduate course, at University of Modena and Reggio Emilia

2016 Laboratory lecturer for the Computer Vision graduate course, Prof. Cucchiara, at University of Modena and Reggio Emilia

Tutor for the Fundamentals of Computer Science I undergraduate course, at University of Modena and Reggio Emilia

2015 Laboratory lecturer for the Computer Vision graduate course, Prof. Cucchiara, at University of Modena and Reggio Emilia

Laboratory lecturer for the graduate Master in Visual Computing and Multimedia Technologies, at University of Modena and Reggio Emilia

Tutor for the Fundamentals of Computer Science I undergraduate course, at University of Modena and Reggio Emilia

Teaching assistant for the Machine Learning graduate course: three lectures on Deep Learning and Convolutional Neural Networks

Theses supervision

Stefano Pini (MSc) - Linking people and objects with their proper names in videos

Gianluca Puglia (MSc) - Image and Video Captioning with Transferred Semantic Attributes

Federico Bolelli (MSc, currently PhD Student) - Connected Components Labeling

Marcella Cornia (MSc, currently PhD Student) - Deeply learned Saliency prediction

Fabio Pozzi (MSc) - Shot and scene detection in broadcast videos

Angelo Perri (BSc) - Optimization of convolution algorithms on GPU architectures

Dodiane Carole Ngatcha Nana (BSc) - Optimization of convolution algorithms on multicore architectures

Journals Reviewing

IEEE Transactions on Multimedia

IEEE Transactions on Image Processing

Computer Vision and Image Understanding

Multimedia Tools and Applications

IEEE Transactions on Human-Machine Systems

Academic service

General Chair for IRCDL 2017

Member of the Program Committee for ACM Multimedia 2017 (Multimedia Search and Recommendation and Conflict of Interest tracks)

Member of the Program Committee for CCISP 2017

Reviewer for AVSS 2017

Reviewer for ICCV 2017

Publications

Lorenzo Baraldi, Costantino Grana, and Rita Cucchiara. Hierarchical boundary-aware neural encoder for video captioning. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017.

Lorenzo Baraldi, Costantino Grana, and Rita Cucchiara. Recognizing and presenting the storytelling video structure with deep multimodal networks. *IEEE Transactions on Multimedia*, 2017.

Baraldi Lorenzo, Paci Francesco, Serra Giuseppe, and Cucchiara Rita. Gesture recognition using wearable vision sensors to enhance visitors' museum experiences. *IEEE Sensors Journal*, 15:2705–2714, 2015.

Baraldi Lorenzo, Grana Costantino, and Cucchiara Rita. A deep siamese network for scene detection in broadcast videos. In *Proceedings of the 23rd ACM international conference on Multimedia*, pages 1199–1202, New York, 2015. ACM.

Baraldi Lorenzo, Grana Costantino, and Cucchiara Rita. Scene-driven retrieval in edited videos using aesthetic and semantic deep features. In *Proceedings of the 2016 ACM on International Conference on Multimedia Retrieval*, pages 23–29. ACM, 2016.

Baraldi Lorenzo, Grana Costantino, Messina Alberto, and Cucchiara Rita. A browsing and retrieval system for broadcast videos using scene detection and automatic annotation. In *Proceedings of the 2016 ACM on Multimedia Conference*, pages 733–734. ACM, 2016.

Marcella Cornia, Lorenzo Baraldi, Giuseppe Serra, and Rita Cucchiara. Predicting human eye fixations via an lstm-based saliency attentive model. *arXiv preprint arXiv:1611.09571*, 2016.

Marcella Cornia, Lorenzo Baraldi, Giuseppe Serra, and Rita Cucchiara. A deep multi-level network for saliency prediction. In *Proceedings of the 23rd International Conference on Pattern Recognition*, Cancun, Mexico, December 2016.

Andrea Corbelli, Lorenzo Baraldi, Costantino Grana, and Rita Cucchiara. Historical document digitization through layout analysis and deep content classification. In *Proceedings of the 23rd International Conference on Pattern Recognition*, Cancun, Mexico, December 2016.

Costantino Grana, Lorenzo Baraldi, and Roberto Vezzani. Yacclab - yet another connected components labeling benchmark. In *Proceedings of the 23rd International Conference on Pattern Recognition*, Cancun, Mexico, December 2016.

Baraldi Lorenzo, Paci Francesco, Serra Giuseppe, Benini Luca, and Cucchiara Rita. Gesture recognition in ego-centric videos using dense trajectories and hand segmentation. In *Computer Vision and Pattern Recognition Workshops (CVPRW), 2014 IEEE Conference on*. IEEE, 2014.

Giuseppe Serra, Marco Camurri, Lorenzo Baraldi, Michela Benedetti, and Rita Cucchiara. Hand segmentation for gesture recognition in ego-vision. In *Proceedings of the 3rd ACM international workshop on Interactive multimedia on mobile and portable devices*, pages 31–36, New York, 2013. ACM.

Baraldi Lorenzo, Grana Costantino, Borghi Guido, Vezzani Roberto, and Cucchiara Rita. Shot, scene and keyframe ordering for interactive video re-use. In *Proceedings of the 11th Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications*, volume 4, pages 626–631, 2016.

Baraldi Lorenzo, Grana Costantino, and Cucchiara Rita. Scene segmentation using temporal clustering for accessing and re-using broadcast video. In *Proceedings - IEEE International Conference on Multimedia and Expo*, volume 2015-, pages 1–6. IEEE Computer Society, 2015.

Baraldi Lorenzo, Grana Costantino, and Cucchiara Rita. Measuring scene detection performance. In *Pattern Recognition and Image Analysis*, volume 9117, pages 395–403. Springer Verlag, 2015.

Baraldi Lorenzo, Grana Costantino, and Cucchiara Rita. Shot and scene detection via hierarchical clustering for re-using broadcast video. In *Computer Analysis of Images and Patterns*, volume 9256, pages 801–811, Heidelberg, 2015. Springer Verlag Germany.

Paci Francesco, Baraldi Lorenzo, Serra Giuseppe, Cucchiara Rita, and Benini Luca. Context change detection for an ultra-low power low-resolution ego-vision imager. In *Computer Vision – ECCV 2016 Workshops*, volume 9913, pages 589–602. Springer International Publishing, 2016.

Baraldi Lorenzo, Grana Costantino, and Cucchiara Rita. Analysis and re-use of videos in educational digital libraries with automatic scene detection. In *Digital Libraries on the Move*, volume 612, pages 155–164. Springer International Publishing, 2016.

Corbelli Andrea, Baraldi Lorenzo, Balducci Fabrizio, Grana Costantino, and Cucchiara Rita. Layout analysis and content classification in digitized books. In *Proceedings of the 12th Italian Research Conference on Digital Libraries*, 2016.

Grana Costantino, Baraldi Lorenzo, and Bolelli Federico. Optimized connected components labeling with pixel prediction. In *Advanced Concepts for Intelligent Vision Systems*, volume 10016, pages 431–440, Cham, 2016. Springer International Publishing.

Marcella Cornia, Lorenzo Baraldi, Giuseppe Serra, and Rita Cucchiara. Multi-level net: A visual saliency prediction model. In *European Conference on Computer Vision Workshops*, 2016.

Lorenzo Baraldi, Costantino Grana, and Rita Cucchiara. A video library system using scene detection and automatic tagging. In *13th Italian Research Conference On Digital Libraries*, 2017.

Lorenzo Baraldi, Costantino Grana, and Rita Cucchiara. Neuralstory: an interactive multimedia system for video indexing and re-use. In *15th International Workshop on Content-Based Multimedia Indexing*, 2017.

Marcella Cornia, Lorenzo Baraldi, Giuseppe Serra, and Rita Cucchiara. Visual saliency for image captioning in new multimedia services. In *IEEE International Conference on Multimedia and Expo Workshops*, 2017.

Stefano Pini, Marcella Cornia, Lorenzo Baraldi, and Rita Cucchiara. Towards video captioning with naming: A novel dataset and a multi-modal approach. In *International Conference on Image Analysis and Processing*, 2017.

Marcella Cornia, Davide Abati, Lorenzo Baraldi, Andrea Palazzi, Simone Calderara, and Rita Cucchiara. Attentive models in vision: Computing saliency maps in the deep learning era. In *Conference of the Italian Association for Artificial Intelligence*, 2017.

Stefano Pini, Olfa Ben Ahmed, Marcella Cornia, Lorenzo Baraldi, Rita Cucchiara, and Benoit Huet. Modeling multimodal cues in a deep learning-based framework for emotion recognition in the wild. In *19th ACM International Conference on Multimodal Interaction*, 2017.

Marcella Cornia, Stefano Pini, Lorenzo Baraldi, and Rita Cucchiara. Automatic image cropping and selection using saliency: an application to historical manuscripts. In *14th Italian Research Conference On Digital Libraries*, 2018.

ICVSS 2015

International Computer Vision Summer School

To whom it may concern

This is to certify that Lorenzo Baraldi has successfully completed examination session (1 hour) at the International Computer Vision Summer School, held in Sicily, Italy from the 12th of July to the 18th of July 2015. The examination paper was related the courses (30 hours) delivered by the following world-renowned experts in the field, from both academia and industry:

- Yoshua Bengio, Université de Montréal, Canada
- Thomas Brox, University of Freiburg, Germany
- Daniel Buchmuller, Amazon, Cambridge, UK
- Fei-Fei Li, Stanford University, USA
- Marc Pollefeys, ETH Zurich, Switzerland
- Silvio Savarese, Stanford University, USA
- Cees Snoek, University of Amsterdam, The Netherlands
- Stefano Soatto, UCLA, USA
- Doris Tsao, California Institute of Technology, USA
- Andrea Vedaldi, University of Oxford, United Kingdom
- Rene Vidal, The Johns Hopkins University, USA
- Takeo Kanade, Carnegie Mellon University, USA
- Stéphane Mallat, École Normale Supérieure, France
- Matthew Zeiler, Clarifai, USA

The courses have covered both theoretical and practical aspects of real Computer Vision problems as well as examples of their successful commercialization.

Sicily, 19 July 2015

The School Directors

Prof. Sebastiano Battiato

Prof. Roberto Cipolla

Dr. Giovanni Maria Farinella

CERTIFICATE
OF ATTENDANCE
VISMAC 2016

This is to certify that:

Lorenzo Baraldi

attended the VISMAC International Summer School 2016 that was organized by GIRPR in Pordenone and Grado (Italy) from June 13th to June 17th, 2016. The student successfully fulfilled all requirements of the VISMAC International Summer School 2016 and passed the final exam (4 ETCS).

Date:
June 17th, 2016

Prof. Gian Luca Foresti
Chair

Prof. Christian Micheloni
Chair

Prof. Vito Roberto
Chair