

CURRICULUM VITAE ET STUDIORUM

MARCO TAGLIASACCHI

NOVEMBER 1, 2014

PERSONAL DATA

First name	Marco
Last name	Tagliasacchi
Date of birth	January 10, 1978
Place of birth	Como (Italy)
Nationality	Italian
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CV SUMMARY

Current affiliation

- Assistant Professor (since February 2007) – DEIB – Politecnico di Milano
- Habilitation as Associate Professor (since Dec. 2013) in two areas: Computer Eng., Telecommunications

Research

- Image and video processing (multimedia forensics, visual sensor networks)
- Information retrieval (crowdsourcing for multimedia retrieval, top-k query processing)

Publications:

- 24 journal papers (2 ACM Transactions, 10 IEEE Transactions)
- more than 100 conference papers (26 ICIP, 16 ICASSP, 2 SIGMOD, 1 VLDB)
- number of co-authors: median 3: mode 2
- 39 papers with co-authors having non-Italian affiliation
- H-index: 23, i10-index: 55, 1582 citations
- 9 paper awards

International collaborations:

- *Imperial College London* – UK – Visiting academic (2012)
- *UC Berkeley* – USA – Visiting scholar (2004)
- Other collaborations: *Télécom ParisTech* – France, *University College London* – UK, *Instituto Superior Técnico* – Portugal, *EPFL* – Switzerland, *Fraunhofer Institute for Digital Media Technologies* – Germany, *University of Waterloo* – Canada, *KTH* – Sweden

Project coordination:

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|-------------|--|--------------|-----------|------|----------------|
| - GreenEyes | www.greeneyesproject.eu | FP7-FET-Open | 2012-2015 | 400k | Coordinator |
| - REWIND | www.rewindproject.eu | FP7-FET-Open | 2011-2014 | 475k | co-Coordinator |
| - LAURA | laura.como.polimi.it | 5 per mille | 2009-2011 | 70k | co-Coordinator |

Other selected projects:

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|------------|--|-----------|-----------|--|-------------------|
| - SmartH20 | www.smarth2o-fp7.eu | FP7-STREP | 2014-2016 | | Scient. investig. |
| - CUBRIK | www.cubrikproject.eu | FP7-IP | 2011-2014 | | WP leader |
| - SeCo | www.search-computing.it | ERC AdG | 2009-2011 | | Scient. investig. |
- Industrial funded projects with Telecom Italia, ST Microelectronics, Technogym, KeeSquare, Fastweb
 - ERC Starting Grant 2013 – passed step 1 of the evaluation

Professional activities

- Associate Editor: IEEE Trans. CSVT, APSIPA Trans. SIP, EURASIP Signal Proc.: Image Comm.
- General co-chair: IEEE Multimedia Signal Processing Workshop 2013
- IEEE Information Forensics and Security Technical Committee (elected) – 2014-2016
- IEEE Multimedia Signal Processing Technical Committee (elected) – 2009-2012
- Technical Program Committee member: IEEE ICIP, ACM MM, IEEE ICASSP, IEEE ICME, etc.

Patents:

- 1 patent granted, 2 patents transferred (Telecom Italia, Technogym)

Teaching:

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|--|--------------|-----------|--------------------------|
| - Information Retrieval and Data Mining | since 2013 | 3.53/4.00 | Faculty average 3.07/4.0 |
| - Digital Image Processing | 2011-to date | 3.64/4.00 | “ “ |
| - Multimedia Signal Processing – part II | 2009-to date | 3.67/4.00 | “ “ |
| - Multimedia Information Retrieval | 2009-2012 | 3.61/4.00 | Faculty average 2.96/4.0 |

Supervision

- Co-supervision of 5 Ph.D. students + 4 Ph.D. students graduated in 2009, 2011 and 2014, respectively.
 - Supervised more than 30 M.Sc. theses in Computer Systems and Engineering
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PROFESSIONAL EXPERIENCE

- Since 12/2013 Received the “Abilitazione Scientifica Nazionale” as Associate Professor (Professore di II fascia) in the areas of Computer Engineering (09/H1 - ING-INF/05 Sistemi di Elaborazione delle Informazioni”) and Telecommunications (09/F2 - ING-INF/03 Telecomunicazioni)
- Since 02/2007 **Assistant Professor** (Ricercatore di ruolo confermato) at the Department of Electronics, Information and Bioengineering (Dipartimento di Elettronica, Informazione e Bioingegneria), Politecnico di Milano, Italy
- 04/2006-1/2007 Post-doc research assistant (assegnista di ricerca) at the Department of Electronics and Information, Politecnico di Milano, Italy

INTERNATIONAL COLLABORATION

- 01/2012-05/2012 Visiting academic at the **Imperial College London**, cooperating with Prof. Pier Luigi Dragotti.
- 01/2004-07/2004 Visiting scholar at the **University of California, Berkeley** affiliated with the BASICS group (Berkeley Audio-Visual and Communication Systems, Prof. Kannan Ramchandran)

Other past and current collaborations:

- Instituto Superior Técnico – Portugal;
- University College London – UK;
- KTH – Sweden;
- University of Campinas – Brazil;
- Télécom ParisTech – France;
- Fraunhofer Institute for Digital Media Technologies – Germany;
- Technische Universität Berlin
- UPC – Spain;
- EPFL - Switzerland;
- University of Waterloo – Canada;
- Mississippi State University – USA.

AFFILIATIONS

- 01/2014-12/2016 Elected member of the IEEE Information Forensics and Security Technical Committee.
- 01/2013- Associate member of the IEEE Multimedia Signal Processing Technical Committee.
- 01/2009-12/2012 Elected member of the IEEE Multimedia Signal Processing Technical Committee.
- Since 01/2009 Member of the ACM
- Since 01/2009 Member of the IEEE Computer Society
- Since 01/2007 Member of the IEEE
- Member of the IEEE Signal Processing Society
- Since 01/2004 Student Member of the IEEE (Institute of Electrical and Electronics Engineers)
- Member of the IEEE Signal Processing Society
- 2004-2005 Member of the MPEG (Movie Picture Expert Group, ISO/IEC JTC 1/SC 29/WG 11) working group

EDUCATION

- 03/2003-02/2006 Ph.D. student in Information Engineering at the Department of Electronics and Information, Politecnico di Milano, Italy
Thesis title: “Advanced scalable video coding techniques”. Advisor: Prof. S. Tubaro
- 02/2002 Laurea degree (a five year program that combines B.Sc. and M.Sc.) in Computer Engineering at the Politecnico di Milano, Italy

- Final grade: summa cum laude, **GPA: 29.76 out of 30**
- Completed the five year program in **4 and a half years**

Thesis title: “Design of web-based vertical solutions”. Advisor: Prof. P. Fraternali

09/2000-06/2001 One year of study abroad within the SOCRATES/ERASMUS Exchange program at the Brunel University, Uxbridge, West London, UK

RESEARCH ACTIVITIES

IMAGE AND VIDEO PROCESSING

- Multimedia forensics [C.121.,C.118., C.116., C.115., C.111., C.110., C.105., C.103., C.101., C.100., C.99., C.96., C.95., C.94., C.89., C.88., C.87., A.21., C.86., C.82., A.18., C.79., C.75., C.74., A.9., A.7., C.71., C.66., C.64., C.59., C.54., C.47., C.42.]

With the rapid proliferation of inexpensive acquisition and storage devices multimedia objects can be easily created, stored, transmitted, modified and tampered with by anyone. During its lifetime, a digital object might go through several processing stages, including multiple analog-to-digital (A/D) and digital-to-analog (D/A) conversions, coding and decoding, transmission, editing (either aimed at enhancing the quality, creating new contents mixing pre-existing materials, or tampering with the content). We are aiming at synergistically combining principles of signal processing, machine learning and information theory to answer relevant questions on the past history of such objects. We started from the observation that each of these processing steps necessarily leaves a characteristic footprint, which can be potentially detected to trace back the past history of the available multimedia object in a blind fashion, i.e. without having access to the original content. We are focusing on detecting acquisition-, coding- and editing-based footprints in images and videos with impact in forensic and law enforcement applications.

- Visual sensor networks [A.24., A.23., C.114., C.113., C.112., C.107., C.104., C.102., C.98., C.97., C.91., C.90., C.83., C.81., C.80., A.11., C.52.]

We aim at developing new methodologies, practical algorithms and protocols, to empower WSNs with vision capabilities similar to those achievable by power-eager smart camera systems. The key tenet is that most visual analysis tasks can be carried out based on a succinct representation of the image, which entails both global and local features, while it disregards the underlying pixel-level representation. We are tackling the problem by proposing a novel joint analyze-and-compress paradigm. That is, image features are collected by sensing nodes, are processed, and are then delivered to the final destination(s) in order to enable higher level visual analysis tasks by means of either centralized or distributed detectors and classifiers, somewhat mimicking the processing of visual stimuli in the early visual system. The current activities are rooted in our previous work, in which we showed how to perform video analysis without the need for reconstructing the video sequence beforehand, exploiting compressed sensing.

INFORMATION RETRIEVAL

- Crowdsourcing for multimedia retrieval [C.117., C.109., C.108., C.106., C.85., C.77., C.76.]

We aim at improving the performance of commonly used multimedia content analysis algorithms by properly merging automatic decisions with human-computed results, thus realizing a more integrated collaboration between human judgement and algorithms. In particular, we are currently studying the problem of reducing the uncertainty in ranked result sets with human computation and how to optimally allocate human workers to tasks.

- Top-k query processing [A.22., A.20., A.17., A.15., C.84., C.79., C.78., C.72., C.69., C.67., A.13., A.12., B.4., C.51., C.58.]

In many information retrieval tasks, the user is interested only in the top-k results. We have been studying different aspects of top-k query processing that arise when joining heterogeneous services to answer complex queries. In particular, we studied: i) the optimization of the access plan to fetch data from the individual services; ii) how to deal with uncertainty in the scoring function; iii) how to diversify search results, so as to return items that are both relevant and diverse.

PAST RESEARCH ACTIVITIES

VIDEO PROCESSING

- Video quality assessment [A.16., A.14., A.10., A.8., C.61., C.57., C.55., C.50., C.48., C.46., C.45.]
Video data represents the large part of the traffic on the Internet. Therefore, there is a strong demand for automatic mechanisms able to evaluate the playout quality of video sequences at the clients. This is especially important when video streams are transmitted over best-effort networks and the quality of service cannot be guaranteed. We have investigated the problem of video quality assessment both in a no-reference (i.e. the original video sequence is not available) and in a reduced-reference (i.e. a small size auxiliary stream accompanies the main video stream) scenario. We have developed objective quality metrics that are well correlated with the perceptual quality of impaired video. We have made available to the research community the data collected during an extensive subjective evaluation campaign.
- Distributed video coding [A.5., A.3., A.1., C.44., C.34., C.33., C.28., C.26., C.24., C.23., C.22., C.21., C.17., C.16., C.15., C.14., C.13., C.12., C.10., C.9., C.8., C.7., C.6.]
Distributed video coding is a recent coding paradigm that enables a flexible distribution of the computational complexity between encoder and decoder, by moving part of the motion estimation task at the decoder. The research has focused on several aspects related to distributed video coding: improving the coding efficiency of state-of-the-art coding architectures, removing some issues that prevented such coding architectures from being applied in practical scenarios; studying the rate-distortion performance of distributed video coding and comparing it with conventional motion-compensated predictive codecs. The research activities have also addressed how to exploit distributed video coding to enhance the robustness with respect to packet losses.
- Non-normative tools for video coding [A.6., A.4., B.2., B.1., C.38., C.36., C.35., C.32., C.18., C.11., C.2.]
In order to ensure interoperability, video coding standards define only the syntax of the bitstream and how to perform decoding. Several components are not specified by the standards, including motion estimation, rate allocation, rate control, error concealment, etc. The research has focused on non-normative tools for the state-of-the-art H.264/AVC video coding standard, with particular emphasis on error resilience and rate control.
- Scalable video coding [A.2., C.5., C.4., C.3.]
When video contents are distributed over heterogeneous networks and devices it is desirable to adapt the bitstream to the characteristics of the receiving device. Scalable video coding enables bitstream adaptation without the need of transcoding, i.e. partial decoding followed by re-encoding. The bitstream corresponding to the desired frame-rate, spatial resolution and quality can be readily extracted from the original bitstream. The research has focused on wavelet-based scalable video coding techniques, somewhat extending the ideas of JPEG2000 to video signals, and it has led to several contribution to the MPEG, involved in the standardization of a scalable video codec.

AUDIO PROCESSING

- Self-calibration of acoustic cameras [C.63., C.56., C.53.]
Working with multiple microphone arrays requires knowing the relative positioning of each array in the 3D space. By exploiting concepts from the computer vision literature, we have defined the notion of acoustic camera, and addressed the problem of self-calibrating multiple acoustic cameras while minimizing the amount of data exchange between each camera. Both far-field and near-field conditions have been addressed.
- Acoustic source localization and tracking [C.41., C.40., C.39., C.30., C.29., C.27., C.25., C.20., C.19.]
The information about the type of acoustic event can be augmented by the location of the source by space-time processing of signals collected with microphone arrays. We have been working on the problem of acoustic source localization and tracking, especially when more than one source is active at the same time.
- Audio classification [C.31., C.27.]
The goal of this research line is to detect the onset of anomalous events (e.g. gunshots, screams, etc.) in audio streams collected by environmental microphones. The research is proceeding towards modelling the temporal evolution of acoustic features extracted from the audio streams, in order to detect aggressions in public spaces for security applications.

BIOINFORMATICS

- Data analysis algorithms in gene annotation databases [B.5., C.73., C.70, B.3., C.49., C.60.]
Gene annotation databases are widely used as public repositories of biological knowledge. Gene and gene products are annotated with terms taken from unstructured controlled vocabularies or semantically structured ontologies (e.g. the Gene Ontology). We are developing a system which is meant to integrate available data sources providing functional annotations of genes and gene products. In this context, we have developed novel algorithms for automatically predicting newly inferred annotations based on the functional similarity between Gene Ontology terms.

RESEARCH PROJECTS, GRANTS AND FUNDINGPUBLIC FUNDING

Acronym	Funding scheme	Title	Period	Role
GreenEyes	FP7-ICT-2009-C FET-Open Y-E	Networked energy-aware visual analysis	2012- 2015	Project coordinator
REWIND	FP7-ICT-2009-C FET-Open	REVerse engineering of audio-Visual content Data	2011- 2014	Co-coordinator (with Prof. S. Tubaro)
LAURA	Young Researcher Grant - PoliMi	Localization And Ubiquit. monitoRing of pAtients for health care support	2009- 2011	Co-coordinator (with Dr. M. Cesana)
SmartH2O	FP7-ICT-2013-11 STREP	an ICT Platform to leverage on Social Computing for the efficient management of Water Consumption	2014- 2016	Scientific Investigator
Proactive	Regional project	PROtezione del territorio con infrAstrutture iCT avanzate, cIttadinanza attiVa, e rEti sociali	2014- 2015	Scientific Investigator
CUBRIK	FP7-ICT-2011-7 IP	Human-enhanced time-aware multimedia search	2011- 2014	Scientific Investigator / WP leader
SeCo	ERC Advanced Grant	Search Computing	2009- 2011	Scientific Investigator
ARACHNE	PRIN National project	Advanced video stReaming ArCHitectures for peer-to-peer	2010- 2011	Scientific Investigator
SCENIC	FP7-ICT-2009-C FET-Open	Self-configuring environment aware intelligent acoustic sensing	2009- 2011	Scientific Investigator
VISNET-II	FP6-ICT NoE	Networked audio-visual media technologies	2006- 2009	Scientific Investigator
VISNET-I	FP6-ICT NoE	Networked audio-visual media technologies	2004- 2006	Scientific Investigator
DVC	PRIN National project	Robust video coding techniques based on Distributed Source Coding	2005- 2006	Scientific Investigator

ERC Starting Grant 2013 – Passed Step 1 of the evaluation phase.

PRIVATE FUNDING

2009-2010	Co-coordinator in the research contract on video quality assessment with Fastweb
2008-2009	Co-coordinator in the research contract on automatic aggression detection with Keesquare
2008	Co-coordinator in the research contract on automatic speaker recognition in telephone conversations (details undisclosed for NDA clause)
2008	Co-coordinator in the research contract on the scalable extension of the H.264/AVC video coding standard with Telecom Italia
2007-2008	Co-coordinator in the research contract on automatic classification and localization of acoustic events with Keesquare
2003-2004	Scientific investigator in the research contract on <i>wavelet-based scalable video coding</i> with Telecom Italia Lab.

PUBLICATIONS

INTERNATIONAL JOURNAL PAPERSYear 2014

- A.24. ANDREOPOULOS Y., REDONDI A., BURANAPANICHKIT D., CESANA M., TAGLIASACCHI M., “Energy consumption of visual sensor networks: impact of spatio-temporal coverage”, **IEEE Transactions on Circuits and Systems for Video Technology**, to appear, doi: 10.1109/TCSVT.2014.2329378
- A.23. BAROFFIO L., CESANA M., REDONDI A., TAGLIASACCHI M., TUBARO S., “Coding visual features extracted from video sequences”, **IEEE Transactions on Image Processing**, vol. 23, n. 3, May 2014, pp. 2262-2276, doi: 10.1109/TIP.2014.2312617

Year 2013

- A.22. CATALLO I, CICERI E., FRATERNALI P., MARTINENGGHI D., TAGLIASACCHI M., “Top-k diversity queries over bounded regions”, **ACM Transactions on Database Systems**, vol. 38, n. 2, June 2013, pp., 10:1-10:44, doi: 10.1145/2487259.2487262
- A.21. VALENZISE G., TAGLIASACCHI M., TUBARO S., “Revealing the traces of JPEG compression anti-forensics”, **IEEE Transactions on Information Security and Forensics**, vol. 8, n. 2, February 2013, pp. 335-349, doi: 10.1109/TIFS.2012.2234117
- A.20. ABID A, TAGLIASACCHI M., “Provisional reporting for rank joins”, *Journal of Intelligent Information systems*, ISSN: 0925-9902, Springer US, pp. 1-22, doi:10.1007/s10844-012-0234-3
- A.19. REDONDI A., CHIRICO M., BORSANI L., CESANA M., TAGLIASACCHI M., “An integrated system based on wireless sensor networks for patient monitoring, localization and tracking”, *Ad Hoc Networks*, vol. 11, n. 1, January 2013, pp. 39-53, ISSN 1570-8705, doi:10.1016/j.adhoc.2012.04.006

Year 2012

- A.18. MILANI S., FONTANI M., BESTAGINI P., BARNI M., PIVA A., TAGLIASACCHI M., TUBARO S., “An overview on video forensics”, *APSIPA Transactions on Signal and Information Processing*, Vol. 1, 2012, doi: 10.1017/ATSIP.2012.2
- A.17. MARTINENGGHI D., TAGLIASACCHI M., “Proximity measures for rank join”, **ACM Transactions on Database Systems**, Vol. 37, Issue 1, February 2012, pp. 2-46, doi: 10.1145/2109196.2109198.
- A.16. VALENZISE G., MAGNI S., TAGLIASACCHI M., TUBARO S., “No-reference pixel video quality monitoring of channel-induced distortion”, **IEEE Transactions on Circuits and Systems for Video Technology**, vol. 22, n. 4, 2012, p. 605-618. doi:10.1109/TCSVT.2011.2171211.
- A.15. MARTINENGGHI D., TAGLIASACCHI M., “Cost-aware rank join with random and sorted access”, **IEEE Transactions on Knowledge and Data Engineering**, vol. 24, n. 12, December 2012, pp. 2143-2155. doi:10.1109/TKDE.2011.161

Year 2011

- A.14. DE SIMONE F., NACCARI M., TAGLIASACCHI M., DUFAUX F., TUBARO S., EBRAHIMI T., “Subjective quality assessment of H.264/AVC video streaming with packet losses”, *EURASIP Journal on Image and Video Processing*, vol. 2011, Article ID 190431, 12 pages, 2011. doi:10.1155/2011/190431

Year 2010

- A.13. CERI S., ABID A., ABU HELOU M., BOZZON A., BRAGA D., BRAMBILLA M., CAMPI A., CORCOGLIONITI F., DELLA VALLE E., EYNARD D., FRATERNALI P., GROSSNIKLAUS M., MARTINENGGHI D., RONCHI S., TAGLIASACCHI M., VADACCA S., "Search Computing: Managing Complex Search Queries", *IEEE Internet Computing*, vol. 14, n. 6, p. 14-22, 2010. doi: 10.1109/MIC.2010.106
- A.12. MARTINENGGHI D., TAGLIASACCHI M., "Proximity rank-join", **Proceedings of the VLDB Endowment**, vol. 3, n. 1-2, p. 352-363, September 2010.
- A.11. COSSALTER M., TAGLIASACCHI M., VALENZISE G., TUBARO S., "Joint compressive video coding and analysis". **IEEE Transactions on Multimedia**, vol. 12, n. 3, 2010, p. 168-183, doi 10.1109/TMM.2010.2041105
- A.10. TAGLIASACCHI M., VALENZISE G., NACCARI M., TUBARO S., "A reduced-reference structural similarity approximation for videos corrupted by channel errors". *Springer Multimedia Tools and Applications*, Volume 48, Issue 3 (2010), Page 471, doi 10.1007/s11042-010-0473-7

Year 2009

- A.9. TAGLIASACCHI M., VALENZISE G., TUBARO S., "Hash-based identification of sparse image tampering". **IEEE Transactions on Image Processing**, vol. 18, n. 11, p. 2491-2504, November 2009, doi:10.1109/TIP.2009.2028251
- A.8. NACCARI M., TAGLIASACCHI M., TUBARO S., "No-reference video quality monitoring of H.264/AVC coded video", **IEEE Transactions on Multimedia**, vol. 11; n. 11, p. 932-946, 2009, doi:10.1109/TMM.2009.2021785
- A.7. VALENZISE G., PRANDI G., TAGLIASACCHI M., "Identification of sparse audio tampering using distributed source coding and compressive sensing techniques". *EURASIP Journal on Image and Video Processing*, Volume 2009, Article ID 158982, doi:10.1155/2009/158982

Year 2008

- A.6. TAGLIASACCHI M., VALENZISE G., TUBARO S., "Minimum Variance Optimal Rate Allocation for Multiplexed H.264/AVC Bitstreams". **IEEE Transactions on Image Processing**, vol. 17; p. 1129-1143, 2008; doi:10.1109/TIP.2008.924278
- A.5. BERNARDINI R., NACCARI M., RINALDO R., TAGLIASACCHI M., TUBARO S., ZONTONE P., "Rate allocation for robust video streaming based on distributed video coding". *Signal Processing-Image Communication*, vol. 23; 2008; p. 391-403, doi:10.1016/j.image.2008.04.004

Year 2007

- A.4. TAGLIASACCHI M., "A Genetic Algorithm for Optical Flow Estimation". *Image And Vision Computing*, vol. 25; p. 141-147, 2007, doi:10.1016/j.imavis.2006.01.021
- A.3. TAGLIASACCHI M., TUBARO S., FRIGERIO L., "Rate-distortion analysis of motion-compensated interpolation at the decoder in Distributed Video Coding". *IEEE Signal Processing Letters*, vol. 14; p. 625-628, 2007, doi: 10.1109/LSP.2007.896187

Year 2006

- A.2. TAGLIASACCHI M., MAESTRONI D., TUBARO S., SARTI A. "Motion Estimation and Signaling Techniques for 2D+t Scalable Video Coding". *Applied Signal Processing*, vol. 2006; p. 1-21, doi: 10.1155/ASP/2006/57308

- A.1. TAGLIASACCHI M., MAJUMDAR A., RAMCHANDRAN K., TUBARO S., “Robust Wireless Video Multicast based on a Distributed Source Coding Approach”. *Signal Processing*, vol. 86; p. 3196-3211, 2006, doi: 10.1016/j.sigpro.2006.03.024

PAPERS IN PROCEEDINGS OF INTERNATIONAL CONFERENCES

Year 2014

- C.121. GABORINI L., BESTAGINI P., MILANI S., TAGLIASACCHI M., TUBARO S., “Multi-clue image tampering localization”, *IEEE International Workshop on Information Forensics and Security*, Atlanta, USA, December 2014
- C.120. FEDOROV R., FRATERNALI P., TAGLIASACCHI M., “Mountain peak identification in visual content based on coarse Digital Elevation Models”, *ACM International Regular and Data Challenge Workshop on Multimedia Analysis for Ecological Data*, Orlando, USA, November 2014
- C.119. MILANI S., CUCCOVILLO L., AICHROTH P., TAGLIASACCHI M., TUBARO S., “Video Camera Detection Using Audio-Visual Features”, *European Workshop on Visual Information Processing*, Paris, France, December 2014
- C.118. MELLONI A., MILANI S., TAGLIASACCHI M., ROCHA A., TUBARO S., “Image phylogeny through dissimilarity metrics fusion”, *European Workshop on Visual Information Processing*, Paris, France, December 2014
- C.117. NOVAK J., WIENEKE L., DÜRING M., MICHEEL I., MELENHORST M., MORON J.-G., PASINI C., TAGLIASACCHI M., FRATERNALI P. “histoGraph – A Visualization Tool for Collaborative Analysis of Historical Social Networks from Multimedia Collections”, *International Conference on Information Visualization*, Paris, France, July 2014
- C.116. LAMERI S., BESTAGINI P., MELLONI A., MILANI S., ROCHA A., TAGLIASACCHI M., TUBARO S., “Who is my parent? Reconstructing video sequences from partially matching shots”, *IEEE International Conference on Image Processing*, Paris, France, October 2014
- C.115. VALENZISE G., TAGLIASACCHI M., TUBARO S., “Detectability-Quality Trade-Off in JPEG counter-forensics”, *IEEE International Conference on Image Processing*, Paris, France, October 2014, **Top-10% award.**
- C.114. BAROFFIO L., CESANA M., REDONDI A., TAGLIASACCHI M. “BAMBOO: a fast descriptor based on asymmetric pairwise boosting”, *IEEE International Conference on Image Processing*, Paris, France, October 2014
- C.113. REDONDI A., BAROFFIO L., CANCLINI A., CESANA M., TAGLIASACCHI M. “BRISKOLA: BRISK Optimized for Low-Power ARM Architectures”, *IEEE International Conference on Image Processing*, Paris, France, October 2014
- C.112. BAROFFIO L., ASCENSO J., CESANA M., REDONDI A., TAGLIASACCHI M. “Coding binary local features extracted from video sequences”, *IEEE International Conference on Image Processing*, Paris, France, October 2014, **Top-10% award.**
- C.111. MILANI S., BESTAGINI P., TAGLIASACCHI M., TUBARO S., “Demosaicing Strategy Identification Via Eigen Algorithms”, *IEEE International Conference on Acoustics, Speech and Signal Processing*, Firenze, Italy, May 2014.

- C.110. MILANI S., BESTAGINI P., TAGLIASACCHI M., TUBARO S., “Antiforensic synthesis of motion vectors using template algorithms”, IEEE International Conference on Acoustics, Speech and Signal Processing, Firenze, Italy, May 2014.
- C.109. WIENEKE L., DÜRING M., SILLAUME G., LALLEMAND C., CROCE V., LAZZARO M., PASINI C., FRATERNALI P., TAGLIASACCHI M., MELENHORST M., HARLOFF E., MICHEEL I., NOVAK J., MORON J.-G, NUCCI F., “Building the social graph of the History of European Integration: A pipeline for the Integration of Human and Machine Computation”, Digital Humanities, Lausanne, Switzerland, July 2014
- C.108. BERNASCHINA C., FRATERNALI P., GALLI L., MARTINENGGHI D., TAGLIASACCHI M., “Robust aggregation of GWAP tracks for local image annotation”, ACM International Conference on Multimedia Retrieval, Glasgow, UK, April 2014
- C.107. REDONDI A., BURANAPANICHKIT D., CESANA M., TAGLIASACCHI M., ANDREOPOULOUS Y., “Energy Consumption Of Visual Sensor Networks: Impact Of Spatio-Temporal Coverage Based On Single-hop Topologies”, European Conference on Wireless Sensor Network, Oxford, UK, February 2014

Year 2013

- C.106. WIENEKE L., DÜRING M., SILLAUME G., LALLEMAND C., CROCE V., LAZZARO M., PASINI C., FRATERNALI P., TAGLIASACCHI M., MELENHORST M., HARLOFF E., MICHEEL I., NOVAK J., MORON J.-G, NUCCI F., “Building the social graph of the History of European Integration. A pipeline for Humanist-Machine Interaction in the Digital Humanities”, International Workshop in Histoinformatics, Kyoto, Japan, November 2013, pp. 86-99, doi: 10.1007/978-3-642-55285-4_7, ISBN: 978-3-6425-5284-7
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- D.7. REDONDI A., BAROFFIO L., CANCLINI A., CESANA M., TAGLIASACCHI M. DAN G., FODOR V., ERIKSSON E., ASCENSO J., MONTEIRO P. “Enabling Visual Analysis in Wireless Sensor Networks”, IEEE International Conference on Image Processing, Paris, October 2014
- D.6. CANCLINI A., BAROFFIO L., CESANA M., REDONDI A., TAGLIASACCHI M. “Object recognition in visual sensor networks based on compression and transmission of binary local features”, IEEE International Conference on Acoustics, Speech and Signal Processing, Florence, May 2014
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- D.4. BESTAGINI P., COMESANA P., CUCCOVILLO L., DITTMAR C., MANN S., MASCIOPINTO M, VISENTINI SCARZANELLA M., TAGLIASACCHI M., TUBARO S., “REWIND demo”, IEEE International Workshop on Multimedia Signal Processing, Pula, Italy, September 2013
- D.3. CANCLINI A., BAROFFIO L., CESANA M., REDONDI A., TAGLIASACCHI M. “Compress-then-analyze vs. Analyze-then-compress. Two paradigms for image analysis in visual sensor networks”, IEEE International Workshop on Multimedia Signal Processing, Pula, Italy, September 2013
- D.2. BESTAGINI P., VISENTINI SCARZANELLA M., TAGLIASACCHI M., DRAGOTTI P. L., TUBARO S., “Video recapture detection based on ghosting artifact analysis”, GTTI-MMSP meeting, Vezza D’Oglio, Italy, March 2013
- D.1. BESTAGINI P., COMESANA P., DITTMAR C., FONTANI M., VISENTINI SCARZANELLA M., TAGLIASACCHI M., TUBARO S., “REWIND demo”, IEEE International Workshop on Information Security and Forensics”, Tenerife, Spain, December 2013

CHAPTERS IN INTERNATIONAL BOOKS

- B.5. CHICCO D., TAGLIASACCHI M., MASSEROLI M., “Genomic annotation prediction based on integrated information”. In: Biganzoli E, Vellido A, Ambrogi F, Tagliaferri R, editors. Computational Intelligence Methods for Bioinformatics and Biostatistics. ISBN 978-3-642-35685-8. Heidelberg, D: Springer; 2012. p. 238-252. LNCS (Lecture Notes in Bioinformatics; vol 7548).
- B.4. ILYAS I., MARTINENGHI D., TAGLIASACCHI M., “Chapter 11: Rank-join algorithms for Search Computing”. In: Brambilla M and Ceri S, editors. Search Computing – Challenges and Directions. Vol. 5950 of LNCS. Springer, March 2010, doi: 10.1007/978-3-642-12310-8_11
- B.3. MASSEROLI M., TAGLIASACCHI M, “Chapter 8: Web resources for gene list analysis in biomedicine”. In: Lazakidou A, editor. Web-based Applications in Health Care and Biomedicine. ISBN 978-1-4419-1273-2. Heidelberg, D: Springer, 2010. p. 117-141. (Annals of Information Systems Series; vol 7)
- B.2. FUMAGALLI M., TAGLIASACCHI M., TUBARO S., “Expected distortion of DCT coefficients in video streaming over unreliable channel”. Lecture Notes in Computer Science. vol. 3893, p. 1-8, 2006, ISBN/ISSN: 978-3-540-33578-8, doi:10.1007/11738695
- B.1. TAGLIASACCHI M. “Optical flow estimation using genetic algorithms.” Lecture Notes in Computer Science. vol. 2955, p. 309-316, 2006, ISBN/ISSN: 978-3-540-31019-8, doi:10.1007/10983652

PAPERS IN PROCEEDINGS OF NATIONAL CONFERENCES

- N.4. FRATERNALI P., MARTINENGGHI D., TAGLIASACCHI M., “Efficient diversification of top-k queries over bounded regions”. Italian Symposium on Advanced Database Systems, Venice, Italy, June 2012, p. 139-146
- N.3. MASSEROLI M., TAGLIASACCHI M., “Gene functional clustering for improved prediction of Gene Ontology annotations”. In: Attimonelli M, D’Elia D, Pesole G, editors. BITS 2010: VII Annual Meeting of the Bioinformatics Italian Society; 2010 Apr 14-16; Bari, IT. ISBN 978-88-6194-079-6. Bari, IT: Progedit - Progetti editoriali srl; 2010.p. 39-41.
- N.2. BRAGA D.M., BRAMBILLA M., CAMPI A., CERI S., DANIEL F., DELLA VALLE E., FRATERNALI P., MARTINENGGHI D., TAGLIASACCHI M., “Search Computing: a European research for querying the web”, Italian Symposium on Advanced Database Systems, Camogli, Italy, June 2009, p. 57-64
- N.1. TAGLIASACCHI M., MASSEROLI M., “Improved Gene Ontology annotation predictions through Bayesian network post-processing”. Sixth Annual Meeting of the Bioinformatics Italian Society, Genova, Italy, March 2009

THESIS

- H.2. TAGLIASACCHI, M. “Advanced scalable video coding techniques”. Ph.D. Thesis, Dipartimento di Elettronica e Informazione, Politecnico di Milano, Italy
- H.1. TAGLIASACCHI, M. “Designing web based vertical solutions”. M.Sc. Thesis, Politecnico di Milano, Italy

PATENTS

- P.4. D. Braga, M. Brambilla, A. Campi, S. Ceri, E. Della Valle, P. Fraternali, D. Martinenghi, M. Tagliasacchi. “Method for extracting, merging and ranking search engine results.” US Patent Application No. 12/540700, granted in March 2012 - Patent holder: Politecnico di Milano
- P.3. Patent N. MO2011A000013, “Apparato e metodo per la localizzazione del punto di impatto di un corpo su una superficie”, Filed: February 2, 2011. Transferred to Technogym
- P.2. Patent N. PCT/EP2006/006393. “Method, apparatus and system for robust video transmission”; Filed: July, 5th 2006. Transferred to Telecom Italia
- P.1. Patent N. MI2004A000126. “Metodo e sistema per la stima del moto tra una immagine corrente ed una immagine precedente di un segnale video – (Method for motion estimation between the current and previous frame in a video sequence”); Filed: January,29th 2004.

INVITED TALKS

- T.10. *Riconoscere il falso digitale*, invited talk, AEIT Associazione Italiana di Elettrotecnica, Elettronica, Automazione, Informatica e Telecomunicazioni, Milano, March 2013
- T.9. *Analysis of coding footprints for multimedia forensics*, invited talk, IEEE SPS Italy Chapter Summer School on Signal Processing, Riotorto, September 2013
- T.8. *Streaming visual features*, invited talk, GTTI Thematic Group on Multimedia Signal Processing, Vezza D’Oglio, March 2013
- T.7. *Crowdsourcing for multimedia retrieval*, invited talk, Summer School on Social Media Modeling and Search, Santorini, Greece, September 2012

- T.6. *REWIND – Reverse Engineering audio-visual content data*, invited talk, Queen Mary University, London, UK, May 2012
- T.5. *REWIND – Reverse Engineering audio-visual content data*, invited talk, BBC R&D, London, UK, April 2012
- T.4. *Forensic and anti-forensic methods for JPEG-based image authentication*, invited talk, Imperial College of London, UK, March 2012
- T.3. *Compressive Sensing: basic principles and applications in image and video processing*, tutorial talk, International Workshop on Image Analysis for Multimedia Interactive Services, Desenzano sul Garda, April 2010
- T.2. *Quality assessment of H.264/AVC video streaming with packet losses*, ACM Multimedia Technical Committee Workshop, New York, June 2009
- T.1. *Video coding based on distributed source coding principles*, MPEG Workshop on Workshop on Future Directions in Video Coding, Busan, South Korea, April 2005

AWARDS

- A.10. Top-10% paper award at the *IEEE International Conference on Image Processing* for the work C.115
- A.9. Top-10% paper award at the *IEEE International Conference on Image Processing* for the work C.112
- A.8. Best paper award at the *International Conference on Information Visualization* for the work C.117
- A.7. Top-10% paper award at the *IEEE International Workshop on Multimedia Signal Processing 2013* for the work C.100.
- A.6. Top-10% paper award at the *IEEE International Workshop on Multimedia Signal Processing 2012* for the work C.82.
- A.5. 2011 Best Associate Editor award – *IEEE Transactions on Circuits and Systems for Video Technology*
- A.4. Best student paper award (2nd prize) at the *IEEE International Conference on Image Processing*, for the work C.71 (with Giuseppe Valenzise)
- A.3. Young researcher best paper prize at the *Eighth International Meeting on Computational Intelligence Methods for Bioinformatics and Biostatistics 2011*, for the work C.70. (with Davide Chicco)
- A.2. Top-10% paper award at the *IEEE International Workshop on Multimedia Signal Processing 2009* for the work C.50
- A.1. Best Student Paper Award at the *International Workshop on Quality of Multimedia Experience 2009* for the work C.52 (with Francesca De Simone)

PROFESSIONAL ACTIVITIES

Associate Editor for the following journals:

- IEEE Transactions on Circuit and Systems for Video Technology (since Oct, 2010)
- APSIPA Transactions on Signal and Information Processing (since Dec, 2011)
- EURASIP Signal Processing: Image Communication (Since August 2013)

Editor of Special Issues

- Recent advances on analysis and processing for distributed video systems, *Journal of Visual Communication and Image Representation*, Elsevier.

Reviewer for the following international journals:

- IEEE Signal Processing Magazine
- IEEE Transaction on Image Processing
- IEEE Transactions on Multimedia
- IEEE Transactions on Circuit and Systems for Video Technology
- IEEE Transactions on Information Forensics and Security
- IEEE Signal Processing Letters

- Signal Processing: Image Communication
- Image and Vision Computing, Elsevier

Member of the organizing committee of the following conferences:

- Technical program coordinator: IEEE International Conference on Multimedia & Expo 2015
- **General co-Chair:** IEEE Multimedia Signal Processing Workshop 2013
- ACM/IEEE ICDSC 2009 (International Conference on Distributed Smart Cameras)
- DAFX 2009 (International Conference on Digital Audio Effects)

Member of the technical program committee of the following conferences:

- IEEE IFS Area Chair on Forensics - 2014
- IEEE Multimedia Signal Processing Workshop (MMSP) 2009, 2010, 2011, 2012, 2013, 2014
- IEEE International Conference on Multimedia and Expo (ICME) 2011, 2012, 2013 (Area Chair: Multimedia Signal Processing, Demo session Chair)
- IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2013, 2014
- Packet Video Workshop 2012, 2013
- International Conference on Body Area Networks, 2014
- IEEE International Workshop on Emerging Multimedia Systems and Applications (EMSA) 2012
- IEEE International Conference on Image Processing (ICIP) 2011 – Area Chair, 2014
- ACM Multimedia 2009, 2010, 2013
- Digital Audio Effects (DAFX) 2009

TEACHING ACTIVITIES

COURSES

Since 10/2011	Digital Image Processing (M.Sc. in Computer Engineering, Como Campus, Politecnico di Milano, course taught in English). Latest students' evaluation: 3.64/4.00 (Faculty avg. 3.07).
Since 10/2009	Multimedia Signal Processing – Part II (M.Sc. in Computer Engineering, Como Campus, Politecnico di Milano, course taught in English). Latest student's evaluation 3.67/4.00 . (Faculty avg. 3.07).
Since 10/2013	Information Retrieval and Data Mining (M.Sc. in Computer Engineering, Como Campus, Politecnico di Milano, course taught in English). Latest student's evaluation 3.53/4.00 . (Faculty avg. 3.07).

PAST COURSES

10/2009-09/2013	Multimedia Information Retrieval (M.Sc. in Computer Engineering, Como Campus, Politecnico di Milano, course taught in English). Latest students' evaluation: 3.61/4.00 . (Faculty avg. 2.96).
03/2009-06/2011	Laboratorio di Sviluppo Progetto/Laboratorio di design per l'interazione – (M.Sc. in Communication Design, Politecnico di Milano)
10/2006-09/2009	Fundamentals of Audio/Video Signal Processing (M.Sc. in Computer Engineering, Como Campus, Politecnico di Milano, course taught in English)
10/2006-09/2009	Digital Audio/Video Signal Processing (M.Sc. in Computer Engineering, Como Campus, Politecnico di Milano, course taught in English)
03/2006-09/2009	Advanced Digital Image Processing Project (M.Sc. in Computer Engineering, Como Campus, Politecnico di Milano, course taught in English)
10/2007-09/2008	Computer Science (B.Sc. in Design, Politecnico di Milano)

PAST TEACHING ASSISTANTSHIPS

10/2009-02/2010	Bioinformatica e Biologia Computazionale per la Medicina Molecolare. (M.Sc. in Computer Engineering, Politecnico di Milano)
10/2005-09/2007	Methods and Technologies for Image Processing (M.Sc. in Computer Engineering, Como Campus, Politecnico di Milano, course taught in English)
03/2007-02/2008	Web Technologies (online B.Sc. in Computer Engineering, Politecnico di Milano)
03/2003-02/2007	Information Systems (online B.Sc. in Computer Engineering, Politecnico di Milano)
10/2003-09/2006	Digital Audio/Video Signal Processing (M.Sc. in Computer Engineering, Como Campus, Politecnico di Milano)
03/2003-09/2003	Information Systems (B.Sc. in Computer Engineering, Como Campus, Politecnico di Milano)
10/2002-09/2004	Computer Science (B.Sc. in Design, Politecnico di Milano)
05/2002	Web design laboratory (M.Sc. in Design, Politecnico di Milano)

STUDENTS

Since 2007, I have directly supervised the work of 36 M.Sc. students during their thesis in Computer Engineering (including 6 out of the top-10 graduates of M.Sc. in Computer Engineering – Como Campus). I have also co-supervised four Ph.D. students (Matteo Naccari, 2009, with Prof. S. Tubaro; Giuseppe Valenzise, 2011, with Prof. S. Tubaro; Alessandro Redondi, 2014, with Prof. M. Cesana; Paolo Bestagini, 2014, with Prof. S. Tubaro). I am currently co-supervising five Ph.D. students (together with Dr. M. Cesana, Prof. P. Fraternali and Prof. S. Tubaro).

OTHER PROFESSIONAL ACTIVITIES

10/2001-03/2003	Software engineer at WebRatio, a spin-off of the Politecnico di Milano. Developed modules of a CASE (Computer-Aided Software Engineering) tool, specifically designed for database driven Web applications
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