
STEFANO MELACCI

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PERSONAL INFORMATION

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https://scholar.google.com/citations?user=_HHu1MQAAAAJ

SHORT BIO - RESEARCH INTERESTS

I am an Associate Professor of the Department of Information Engineering and Mathematics (DIISM) of the University of Siena (Siena, Italy), since January 2021 (previously: Senior Researcher since January 2018). My profile is strongly characterized by **research activities**, both in the academy and in the industry, focussing on **Machine Learning** and, more generally, **Artificial Intelligence** (see the publications at the end of this CV).

During the last years, my research activity has concerned Machine Learning algorithms that process continuous streams of data with a strong emphasis on the temporal dynamics of the learning mechanisms and considering visual information (videos) and text flows (narrations, conversations). In the case of vision, I worked on the extraction of features from video streams with Deep Architectures subject to coherence constraints with respect to motion, and models that reproduce the temporal dynamics of human attention (<http://sailab.diism.unisi.it/lve/>). In the text domain, I proposed models for the disambiguation of entities and relations in an online manner, progressively building a knowledge base, and generative models that simulate creative processes such as the generation of short poems. In order to facilitate the application of these studies to different classes of neural networks, I carried out activities aimed at proposing Local Information Propagation models, both for vector data and for graph processing.

Together with these studies, I further matured my already consolidated experiences in learning from symbolic and sub-symbolic information (Learning from Constraints <https://sailab.diism.unisi.it/learning-from-constraints/>) in order to integrate neural networks (Shallow and Deep) or kernel machines with knowledge bases. I have applied these experiences both in problems of Emotion Recognition in videos and text, and in order to define models of interpretation of neural networks through the generation of logical constraints, thus extracting new knowledge on the considered problem. I investigated the link between domain knowledge and the recognition of adversarial examples (Adversarial Machine Learning).

Previously, I studied and proposed innovative technologies for conversational systems based on Machine Learning for industrial applications (Italian and foreign companies), also covering the role of Research Manager. I was a Research Fellow (5 years) at the Department of Information Engineering and Mathematics of the University of Siena, where I obtained my PhD in 2010, in addition to the Master's Degree in Computer Engineering (cum Laude), on research topics involving Machine Learning, Manifold Regularization and neural networks for learning Similarity Measures.

I have been serving as Associate Editor of the popular journal IEEE Transactions on Neural Networks and Learning Systems for six years (2017-2022), and I am an active reviewer for several international conferences and journals in the field of Machine Learning. I am a member of the board of the National PhD programme on Artificial Intelligence for Society (Italy).

CURRENT POSITION

Dep. of Information Engineering and Mathematics, Univ. of Siena 2021-Today

- Associate Professor, S.S.D. ING-INF/05.
 - *Topics:* Machine Learning (Learning from Constraints, Neural Networks, Deep Learning, Explainable AI, Adversarial Machine Learning, Misc Applications).

PREVIOUS
POSITIONS

Dep. of Information Engineering and Mathematics, Univ. of Siena 2018-2020

- Senior Researcher (RTD B – Tenure-Track Assistant Professor).
 - *Topics:* Machine Learning based Conversational Systems, and Computer Vision algorithms that process video streams (Learning from Constraints, Neural Networks, Deep Learning).

Quest-IT S.r.l., Siena, Italy 2015-2017

- Research and Development (Research Manager since 2016).
 - *Topics:* Machine Learning based Conversational Systems, Word-Sense Disambiguation, Question Answering, Natural Language Processing (Multi Language) using Kernel Machines and Deep Neural Networks.

Department of Information Engineering, University of Siena, Italy 2010-2015

- Research Associate, S.S.D. ING-INF/05 (Italian “Assegno di Ricerca, art. 22 della Legge 240/2010” - 24 months) from March 1, 2013 to February 28, 2015 (ref: Prof. Marco Gori).
 - *Main Topic:* Machine Learning techniques for Developmental Vision Agents.
 - *Details:* Real-Time processing of video streams, Machine Learning based Object Recognition (Learning from Constraints; Deep Networks; Kernel Machines)
- Research Associate, S.S.D. ING-INF/05 (Italian “Assegno di Ricerca, art. 22 della Legge 240/2010” - 12 months) from March 1, 2012 to February 28, 2013 (ref: Prof. Alessandro Agnetis)
 - *Main Topic:* Optimization models to manage critical resources in hospitals.
 - *Details:* Analysis and development of optimization models to more efficiently organize the most critical resources in hospitals.
- Research Associate, S.S.D. ING-INF/05 (Italian “Assegno di Ricerca, art. 51, comma 6, della Legge 449/1997” - 24 months) from February 1, 2010 to January 31, 2012 (ref: Prof. Marco Gori).
 - *Main Topic:* Machine Learning, Artificial Intelligence.
 - *Details:* Study and formal definition of the basic elements of the theory of Learning from Constraints, that allows Machine Learning models to be integrated with symbolic knowledge representations (First-Order Logic, for example).

EDUCATION

MIUR 2017

- National qualification for becoming Associate Professor - **Abilitazione Scientifica Nazionale (ASN)** (seconda fascia, ING-INF/05).

Department of Information Engineering, University of Siena, Italy 2006-2010

- **Ph.D. in Information Engineering** (Adaptive Systems for Information Processing - XXII Cycle), April 9, 2010.
 - *Thesis:* “Learning with Pairwise Constraints”, Advisor: Prof. Marco Maggini.
 - *Topics:* Machine Learning, Kernel Machines, Manifold Regularization, Neural-Network-based Similarity Measures, basic framework of Learning from Constraints.

Ohio State University, Columbus, OH, USA 2009

- **Visiting Scholar** at the Department of Computer Science and Engineering (under the supervision of Prof. Mikhail Belkin), April 2009 - September 2009.
 - *Topics:* Semi-Supervised Learning, Manifold Regularization, Kernel Methods.

University of Chicago, Chicago, IL, USA 2009

- **Summer School Theory of Computational Learning**, sponsored by NSF, June 1-11, 2009.

University of Bologna Residential Center, Bertinoro, Forlì-Cesena 2007

- **Summer School** *The Analysis of Patterns (2nd meeting)*, sponsored by Pascal Network of Excellence, October 21-27, 2007.

University of Florence, Italy 2007

- Qualification exam to become a licensed engineer, January 2007.

University of Siena, Italy 2004-2006

- **M.S. (cum Laude)**, Computer Science (Italian “Ingegneria Informatica (Sistemi Informatici e Multimediali), Classe 35/S”), September 25, 2006.
 - Thesis: “*Generazione automatica di caricature: Image Warping*” (“*Automatic generation of caricatures: Image Warping*”), Advisor: Prof. Marco Maggini.
- B.S. 107/110, Computer Science, (Italian “Ingegneria Informatica (Reti e Sistemi Informatici e Multimediali)”), October 11, 2004.
 - Thesis: “*Gestione del processo di creazione di un learning set per l’addestramento di un classificatore. di documenti attraverso un’interfaccia web multi-utente*” (“*Generation of the learning set for an automatic document classifier by a multi-user web interface*”), Advisor: Prof. Marco Maggini.

Liceo Scientifico G. da Castiglione, Castiglione F.no (Arezzo), Italy 1995-2000

- High school certificate of education (Italian “Maturità Scientifica”), with mark 100/100, July 2000.

LANGUAGES

- Italian (mother tongue)
- English (very good reading/writing skills, good oral skills)
Cambridge PET certification obtained (final score: Pass with Merit)

ACADEMIC EXPERIENCE

University of Siena, Siena, Italy

Academic year 2022-2023	Department of Information Engineering and Mathematics, Master of Science in Artificial Intelligence and Automation Engineering: “ <i>Machine Learning: Mod. Neural Networks</i> ”, 54 hours, 6 CFU, SSD ING-INF/05 (1st year students).
Academic year 2022-2023 2021-2022	Department of Information Engineering and Mathematics, Master of Science in Artificial Intelligence and Automation Engineering: “ <i>Neural Networks</i> ”, 54 hours, 6 CFU, SSD ING-INF/05 (2nd year students; the 2022-2023 edition is the same as the course above).
Academic year 2022-2023 2021-2022 2020-2021 2019-2020 2018-2019	Department of Information Engineering and Mathematics, Degree course in Computer and Information Engineering, Italian “Corso di Laurea in Ingegneria Informatica e dell’Informazione: <i>Fondamenti di Programmazione</i> ” (<i>Basics of Programming</i>), 60 hours, 6 CFU, SSD ING-INF/05.
Academic year 2020-2021	Department of Information Engineering and Mathematics, Master of Science in Computer and Automation Engineering: “ <i>Neural Networks</i> ”, 54 hours, 6 CFU, SSD ING-INF/05.

Academic year 2020-2021	Department of Information Engineering and Mathematics, Training internship for 25 high school students (Liceo Scientifico Galilei, Siena): “ <i>L’Intelligenza Artificiale è intorno a noi: macchine che imparano a prendere decisioni usando Reti Neurali</i> ” (Introduction to AI and Neural Networks), 10 hours (virtual event).
Academic year 2016-2017	Lecturer, PhD program in Information Engineering and Science , Department of Information Engineering and Mathematics: <i>Machine Learning: from Shallow to Deep Architectures</i> , 20 hours.
Academic year 2012-2013	Teaching Assistant (Italian “Didattica integrativa”), Department of Information Engineering and Mathematics, Degree course in Engineering Management, Italian “Corso di Laurea in Ingegneria Gestionale: <i>Fondamenti di Informatica: Laboratorio di Informatica</i> ” (<i>Informatics Laboratory - Programming Course</i>), 17 hours, SSD ING-INF/05.
Academic year 2011-2012	Teaching Assistant (Italian “Supporto alla didattica”), Department of Information Engineering, Degree course in Engineering Management, Italian “Corso di Laurea in Ingegneria Informatica e dell’Informazione ed Ingegneria Gestionale: <i>Fondamenti di Informatica: Laboratorio di Informatica</i> ” (<i>Informatics Laboratory - Programming Course</i>), 30 hours, SSD ING-INF/05.
Academic year 2010-2011	Lecturer (Italian “Docente a contratto”) , Department of Information Engineering, Degree course in Engineering Management, Italian “Corso di Laurea in Ingegneria Gestionale: <i>Laboratorio di Informatica/G</i> ” (<i>Informatics Laboratory - Programming Course</i>), 3 CFU, 34 hours, SSD ING-INF/05.
Academic year 2009-2010	Lecturer (Italian “Docente a contratto”) , Department of Information Engineering, Degree course in Engineering Management, Italian “Corso di Laurea in Ingegneria Gestionale: <i>Fondamenti di Informatica/G: Laboratorio di Informatica B</i> ” (<i>Informatics Laboratory - Programming Course</i>), 3 CFU, 34 hours, SSD ING-INF/05.
Academic year 2008-2009	Teaching Assistant (Italian “Supporto alla didattica”), Department of Information Engineering, Degree course in Computer Science, Italian “Corso di Laurea in Ingegneria Informatica: <i>Fondamenti di Informatica I</i> ” (<i>Basic of Computer Science I</i>), 20 hours, SSD ING-INF/05.
Academic year 2007-2008	Teaching Assistant (Italian “Supporto alla didattica”), Department of Information Engineering, Degree course in Computer Science, Italian “Corso di Laurea in Ingegneria Informatica: <i>Fondamenti di Informatica I</i> ” (<i>Basic of Computer Science I</i>), 20 hours, SSD ING-INF/05.
Academic year 2007-2008	Lecturer, Post-graduate level, Italian “ <i>Master Gints - Corso di Basi di Informatica</i> ”, Master di 1° Livello in Gestione delle Istituzioni Finanziarie e Nuove Tecnologie dell’Informazione” (<i>Basic of Computer Science</i> , Managing of Financial Institutions and New Information Technologies), 4 hours.
Academic years 2007-2008 2006-2007	Several experiences in supporting students while developing their final projects for the courses of Basic of Computer Science I and Artificial Intelligence, School of Engineering.

University of Siena, Arezzo, Italy

Academic year 2014-2015	Lecturer, Italian “ <i>Master Infotext - Corso di Basi di Informatica</i> , Master di 1° Livello in Informatica del Testo ed Edizione Elettronica” (<i>Basic of Computer Science</i>), 24 hours.
Academic year 2013-2014	Lecturer, Italian “ <i>Master Infotext - Corso di Basi di Informatica</i> , Master di 1° Livello in Informatica del Testo ed Edizione Elettronica” (<i>Basic of Computer Science</i>), 24 hours.
Academic year 2012-2013	Lecturer, Italian “ <i>Master Infotext - Corso di Basi di Informatica</i> , Master di 1° Livello in Informatica del Testo ed Edizione Elettronica” (<i>Basic of Computer Science</i>), 24 hours.
Academic year 2011-2012	Lecturer, Italian “ <i>Master Infotext - Corso di Basi di Informatica</i> , Master di 1° Livello in Informatica del Testo ed Edizione Elettronica” (<i>Basic of Computer Science</i>), 18 hours.
Academic year 2010-2011	Lecturer, Italian “ <i>Master Infotext - Corso di Basi di Informatica</i> , Master di 1° Livello in Informatica del Testo ed Edizione Elettronica” (<i>Basic of Computer Science</i>), 10 hours.
Academic year 2010-2011	Teaching Assistant (Italian “Supporto alla didattica”), School of Engineering, Italian Corso di Laurea in Ingegneria dell’Automazione: <i>Fondamenti di Informatica (Basic of Computer Science)</i> , 20 hours, SSD ING-INF/05.

University of Pisa, Pisa, Italy

Academic year 2021-2022	Summer School of the National PhD in Artificial Intelligence for Society: “ <i>Lifelong Learning from Video Streams</i> ”, 2 hours.
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University of Padova, Padova, Italy

Academic year 2020-2021	IEEE/DEI Summer PhD School of Information Engineering Silvano Pupolin–SSIE 2021: “ <i>Continuous Learning from video streams: a virtual agent perspective</i> ”, 2 hours (virtual event).
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Datum Academy, Bidart, France

- **Creation of a Massive Open Online Course (MOOC)** for Datum Academy (<https://www.datumacademy.com/>), used in multiple online European Master degrees in Computer Science, such as “BIHAR: Big Data Intelligence for Human Augmented Reality”, a Master of Science accredited by the CGE (Conférence des Grandes Ecoles) and awarded by ESTIA. Title of the MOOC: “*Machine Learning and Deep Learning*”. Author of 3 (out of 6) modules of the course: “*Learning with Deep Architectures, Computer Vision and Natural Language, Software Packages for Machine Learning*”. Student hours: 15 (created in 2019, still used today).

SUPERVISION OF
STUDENTS

University of Siena, Italy

2006-Today

- Advisor of the M.S. thesis: “*Continual Machine Learning*” by Giacomo Nunziati, Laurea Magistrale in Artificial Intelligence and Automation Engineering, graduated: October 24, 2022.
- Advisor of the B.S. thesis: “*Estrazione Automatica Di Informazioni Da Comandi Vocali*” by Salvatore Gaurrera, Laurea Triennale in Ingegneria Informatica e

- dell'Informazione, graduated: October 17, 2022.
- Advisor of the B.S. thesis: “*Strumenti per analisi di modelli neurali in apprendimento continuo*” by Matteo Manni, Laurea Triennale in Ingegneria Informatica e dell'Informazione, graduated: October 17, 2022.
 - PhD Committee Member, “*Machine Learning Techniques for Image Forensics in Adversarial Setting*”, by Ehsan Nowroozi, PhD in Information Engineering and Science, University of Siena, April 2, 2020.
 - PhD Committee Member, “*Monitoring indoor human activities for Ambient Assisted Living*”, by Antonino Crivello, PhD in Information Engineering and Science, University of Siena, April 26, 2018.
 - Co-advisor of the M.S. thesis: “*Information Extraction by Learning Deep Architectures from Constraints*” by Andrea Zugarini, Laurea Magistrale in Ingegneria Informatica, April 26, 2017.
 - Matteo Ruggero Ronchi, Master Student, School of Engineering. Thesis: “*An Information Theoretic Feature Learning Approach to Visual Recognition*”, December 10, 2012. Now at California Institute of Technology, Pasadena, CA, USA (PhD Student).
 - Several contributes in supervising undergraduate/graduate/PhD students while approaching the research activities in our AI laboratory.

Other Univesities

2021-Oggi

- PhD Committee Member (Reviewer), “*Vulnerability of Machine Learning: A Study on Poisoning Attacks*”, by Antonio Emanuele Cinà, PhD in Computer Science, Ca' Foscari University of Venice, work done in October 2022.
- PhD Committee Member (Examiner), “*Detection and characterization of salient moments for automatic summaries*”, by Laura Melissa Sanabria Rosas, Université Côte d'Azur, Nice, France, December 3, 2021.

RESPONSIBILITIES

*Department of Information Engineering and Mathematics
University of Siena*

2018-Today

- **Member of the Ph.D. Board of the National Ph.D. in Artificial Intelligence for Society**, since cycle XXXVII <https://phd-ai-society.di.unipi.it/> (2021-Today).
- Responsible of the contacts with the USiena Alumni network <https://www.alumni.unisi.it/> (2022-Today).
- Responsible of the website of the Department of Information Engineering and Mathematics (2018-Today).
- **Scientific responsibility of 2 post-docs**: Alessandro Betti, Matteo Tiezzi (2019-Today).

PARTICIPATION
TO SCIENTIFIC
COUNCILS

*Department of Information Engineering and Mathematics
University of Siena*

2019-Today

- Member of the Scientific Council of the joint research laboratory between the Department of Information Engineering and Mathematics (University of Siena) and the company Baker Hughes (Nuovo Pignone, Florence, Italy). Topics: Machine Learning and Natural Language Processing (2022-Today).
- Member of the Scientific Council of the joint research laboratory (SAINLab) between the Department of Information Engineering and Mathematics (University of Siena) and the company QuestIT S.r.l. (The Digital Box S.p.a.). Topics:

Machine Learning and Natural Language Processing (2019-Today).

PARTICIPATION TO EDUCATIONAL PROJECTS	<i>University of Siena</i>	2020-2021
	<ul style="list-style-type: none">- Participation to the first edition of the Human Capital Management (HCM) project (https://www.hcm.unisi.it/), promoted by Almalaurea (https://www.almalaurea.it/), the University of Siena, and several companies/organizations (Fondazione Monte dei Paschi, Procter & Gamble, Alleanza Assicurazioni and others). It is a 1-year project involving 24 selected undergraduate students with different backgrounds, with the goal of training them in different topics, under the guidance of a shared objective, that is the one of improving the sustainability of an already existing local company.- Lectio Magistralis (Italian) in the context of the event “Matematica ed Ingegneria per il lavoro del futuro”, for high-school student, entitled <i>Reti neurali: il nostro smartphone diventa capace di imparare</i>. November 23, 2021	
PARTICIPATION TO RESEARCH PROJECTS	<i>Department of Information Engineering and Mathematics University of Siena</i>	2019-Today
	<ul style="list-style-type: none">- Collaborator. Development and testing of algorithm for defect classification in non-destructive testing. Research agreement with Nuovo Pignone Tecnologie S.r.l., Florence, Italy, resp: Prof. Marco Gori - 1 year (2020).- Collaborator. Semantic Clauses Understanding and Detection platfOrm (SCUDO), Programma Operativo Regionale FESR 2014-2020 Regione Toscana (2021).- Responsible of research unit. PRIN 2017 (MIUR) “Reliable and Explainable Adversarial Machine Learning” - Siena unit (2019-Today).- Collaborator. AI4EU, European Union’s landmark Artificial Intelligence project, Horizon 2020 research and innovation programme, grant agreement No 825619 - Siena unit (2019-Today).	
	<i>CogniTalk S.A.S., Nantes, Francia</i>	2015-2017
	<ul style="list-style-type: none">- Study, research, and proposal of Conversational Agents based on Machine Learning techniques. Integration of symbolic knowledge representation. This activity was performed in the context of the collaboration between QuestIT s.r.l. and CongiTalk S.A.S. - French startup, and that also involved the University of Siena (partially financed by CogniTalk). I was involved as a QuestIT empolyee, and I have been leading the international research group of CongiTalk (from March 1, 2015 to January 31, 2017).	
	<i>Department of Information Engineering and Mathematics, University of Siena</i>	2013-2015
	<ul style="list-style-type: none">- Researcher (Assegnista di Ricerca) involved in the project “Studio di tecniche di apprendimento per DVA (Developmental Visual Agents)” (ref: Prof. Marco Gori). Machine Learning techniques to implement Developmental Visual Agents (from March 1, 2013 to February 28, 2015).	
	<i>Department of Information Engineering, University of Siena</i>	2012-2013
	<ul style="list-style-type: none">- Researcher (Assegnista di Ricerca) involved in the project Ge.Ri.C.O. “Gestione delle Risorse Critiche in ambito Ospedaliero”, financed by Regione Toscana (fondi Par Fas Linea di Azione 1.1.a.3). Development of a Graphical User Interface	

(Java) to manage an automatic scheduler of resources in hospitals (1 Marzo 2012 - 28 Febbraio 2013).

Department of Information Engineering, University of Siena 2011-2013

- Collaborator, PRIN 2009 (MIUR) “Learning Techniques in Relational Domains and Their Applications” - Siena unit (2011-2013).

STAGES AND
WORK
EXPERIENCES

QuestIT S.r.l., Siena 2015-2017

- Research and Development (Research Manager since 2016). Machine Learning based Conversational Systems, Word-Sense Disambiguation, Question Answering, Natural Language Processing (Multi Language) using Kernel Machines and Deep Neural Networks.

ELT Elettronica S.p.A., Rome, Italy 2013

- Study and implementation of advanced mechanisms to discriminate a radar signal against other identical radars on the basis of its own unique and intrinsic characteristics. Research collaboration with the Department of Information Engineering and Mathematics, University of Siena. Details: analysis of radar signals, data-preprocessing, kernel methods for multi-class and one-class classification, probability estimates. Duration: 2 months.

*Department of Information Engineering and Mathematics,
University of Siena, Italy* 2013

- Development of an on-line Content Management System (CMS) for publishing the deliverables of the Ge.Ri.C.O project (Italian “Gestione delle Risorse Critiche in ambito Ospedaliero”, decision support systems for strategic planning in public hospitals). Details: PHP and JavaScript technologies. Duration: 30 days.

CINECA, Bologna, Italy 2012

- Design and implementation of machine learning based video processing software in HPC platforms. Details: porting of C++ software on HPC. Duration: 1 week.

Department of Communication Sciences, University of Siena, Italy 2011

- Development of C and Java software for server applications and mobile devices. Details: client-server software in C and Java language. Duration: 28 days.

SECO S.r.l., Arezzo, Italy 2010

- Study and implementation of gesture recognition software, exploiting accelerometers and gyroscopes. Details: acquisition of data from humans wearing sensors, temporal sequences, Hidden Markov Models, Support Vector Machines. Duration: 3 months.

Department of Information Engineering, University of Siena, Italy 2006

- Stage for the development of an image-warping system to handle human faces described by a set of feature points. Details: development of Java and Java3D software to exploit accelerated graphic hardware in image processing. Duration: 6 months.

Department of Information Engineering, University of Siena, Italy 2006

- Stage for the development of a multi-user web interface to manage an automatic

document classifier. Details: PHP and MySQL technologies, acquisition of data from a document classifier written in C++. Duration: 4 months.

SEMINARS

- Italian Conference for Robotics and Intelligent Machines, Rome* 2022
- Invited Talk entitled “Lifelong Learning from Video Streams” at the Workshop on “Artificial Perception: from current state of the art in research and industry to the next frontier”, 4th Italian Conference for Robotics and Intelligent Machines (I-RIM) (October 7, 2022)
<https://isar.unipg.it/workshop-artificial-perception-2022/>
- Santa Maria della Scala, Siena* 2019
- Live demo of a conversational system at the meeting entitled “Artificiale, non troppo artificiale. Come fare rete tra le imprese per la creazione di un ecosistema di Intelligenza Artificiale”, organized by QuestIT S.r.l. in collaboration with SAILab (October 25, 2019)
<https://www.quest-it.com/eventi/artificiale-non-troppo-artificiale/>
- Milano Digital Week, Milan, Italy* 2019
- “Visions, perspectives, and practical cases” within the event “Smart city: practical visions and legal issues (in Italian)” (March 15, 2019)
Organized by Dentons, Milan.
<https://insights.dentons.com/77/8894/uploads/agenda-15-marzo-2019.pdf>
- Consorzio Operativo Gruppo Montepaschi, Florence* 2019
- “Sistemi Conversazionali” (Conversational Systems) (June 12, 2018)
- Nantes Machine Learning Meetup, Nantes (Francia)* 2016
- “Semantic Parsing for Question Answering” (November 7, 2016)
Organized and sponsored by CogniTalk S.A.S., Nantes.
<https://www.meetup.com/Nantes-Machine-Learning-Meetup/events/231368002/>
- Department of Information Engineering and Mathematics, University of Siena* 2015
- “Designing Intelligent Conversational Agents” (5 Maggio 2015).
Seminar in the course of Language Processing Technologies, M.S. Degree in Computer Science (Italian “Laurea Magistrale in Ingegneria Informatica e dell’Informazione”) (ref: Prof. Marco Maggini)
- FBK Fondazione Bruno Kessler, Trento, Italy* 2014
- “Learning to See Like Children” (November 11, 2014).
- IMT Lucca, Institute of Advances Studies, Lucca* 2014
- “Learning to See Like Babies” (February 21, 2014).
In the context of the Research Seminars of the institute.
<https://www.imtlucca.it/news-events/events/research-seminars/2014>
- Department of Information Engineering, University of Siena, Italy* 2012
- Unsupervised Learning by Minimal Entropy Encoding (February 27, 2012).
 - Hierarchical Extraction of Convolutional Features (March 5, 2012).
 - Insights on Developmental Visual Agents (March 12, 2012). (ref: Prof. Marco

Gori)

ATTENDED CONFERENCES	<i>Conference on Lifelong Learning Agents (CoLLAs)</i> , Montreal, Canada Poster presentation of [C1] and [C2].	2022
	<i>Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS)</i> , 2021 Virtual Conference, presentation of [W1] at the Data Centric AI Workshop.	2021
	<i>International Joint Conference on Artificial Intelligence and the Pacific Rim International Conference on Artificial Intelligence (2020)</i> , Virtual Conference.	2021
	<i>European Conference on Artificial Intelligence</i> , Virtual Conference.	2020
	<i>International Meeting of the Association for Computational Linguistics</i> , Berlin, DE.	2016
	<i>International Conference on Computer Vision and Pattern Recognition</i> , Columbus, OH, US. Oral presentation ([W10]) at the “Long-term Detection and Tracking” Workshop.	2014
	<i>International Conference on Artificial Neural Networks</i> , Sofia, BG Two oral presentations ([C27, C28]) and a poster presentation ([C26]).	2013
	<i>European Conference on Computer Vision</i> , Firenze, IT Poster presentation ([C30]).	2012
	<i>International Conference on Machine Learning and Applications</i> , Honolulu, Hawaii, USA Poster presentation ([C31]) and oral presentation (of a paper from other authors).	2011
	<i>International Conference on Neural Information Processing</i> , Shanghai, CN Two oral presentations ([C32, C33]).	2011
	<i>International Conference of the Italian Association for Artificial Intelligence</i> Palermo, IT Oral presentation ([C34]).	2011
	<i>International Conference on Artificial Neural Networks</i> , Thessaloniki, GR Oral presentation ([C35]).	2010
	<i>International Joint Conference on Neural Networks</i> , Atlanta, GA, USA Poster presentation ([C37]).	2009
	<i>International Conference on Artificial Neural Networks</i> , Prague, CZ Oral presentation ([C39]).	2008
	<i>International Conference on Computer Analysis of Images and Patterns</i> , Vienna, AU Poster presentation ([C40]).	2007

GRANTS AND AWARDS	• Outstanding Associate Editor Service Award from the IEEE Computational Intelligence Society. Journal: IEEE Transactions on Neural Networks and Learning Systems.	2020
	• Best Student Paper Award Paper: Graziani, Melacci, Gori, “The Role of Coherence in Facial Expression Recognition”, International Conference of the Italian Association for Artificial Intelligence, Trento, IT.	2018

- **Best Student Paper Award** 2009
Paper: Melacci, Maggini, Gori, “Semi-supervised learning with constraints for multi-view object recognition”, International Conference on Artificial Neural Networks, CY.
- *Travel Grant, University College, London, UK* 2009
Machine Learning Summer School, “Theory of Computational Learning”, Chicago, IL, USA.
- *Ph.D. Scholarship (3 years)* 2006
Department of Information Engineering, University of Siena, Italy, Research Profile: “Adaptive Systems for Information Processing”, 2006-2009.

EDITORIAL BOARD	<p>Associate Editor 2017-2022 of the international journal “IEEE Transactions on Neural Networks and Learning System” (IEEE TNNLS), January 1, 2017 - December 31, 2022 (IEEE Computational Intelligence Society; ISSN: 2162-237X).</p> <p>Service Award from the IEEE Computational Intelligence Society: Outstanding Associate Editor (2020)</p> <p>Member of the Early Assessment Committee (since 2020)</p>
SESSION/AREA CHAIR	<ul style="list-style-type: none"> - International Conference on Pattern Recognition (ICPR) Area Chair <i>Track 1: Artificial Intelligence, Machine Learning for Pattern Analysis</i> 2022 - European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases Session Chair <i>Session: Image/Vision</i> 2021 - International Joint Conference on Artificial Intelligence (IJCAI) Session Chair <i>Session: Computer Vision – Language and Vision</i> 2020 - International Joint Conference on Artificial Intelligence (IJCAI) Session Chair <i>Session: Computer Vision – Other</i> 2020
PROGRAM COMMITTEES	<ul style="list-style-type: none"> - International Joint Conference on Artificial Intelligence (IJCAI) 2023 - AAAI Conference on Artificial Intelligence (AAAI) 2022 - International Joint Conference on Artificial Intelligence (IJCAI) 2022 - European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECMLPKDD) 2021 - International Joint Conference on Artificial Intelligence (IJCAI) Senior Program Committee Member 2021 - International Joint Conference on Artificial Intelligence (IJCAI) Senior Program Committee Member 2020 - European Conference on Artificial Intelligence (ECAI) 2020 - European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning (ESANN) 2020 - International Conference of the Italian Association for Artificial Intelligence 2019 - International Workshop on Cognitive and Neural Systems (CNS) 2019 - International Conference on Artificial Neural Networks (ICANN) 2019 - International Joint Conference on Neural Networks (IJCNN) 2019 - International Conference of the Italian Association for Artificial Intelligence 2018 - AI*IA 2018 Doctoral Consortium 2018 - International Conference on Artificial Neural Networks (ICANN) 2018 - European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning (ESANN) 2018

- AAAI Conference on Artificial Intelligence (AAAI) 2018
- International Joint Conference on Artificial Intelligence (IJCAI) 2017
- International Joint Conference on Neural Networks (IJCNN) 2017
- European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning (ESANN) 2017
- International Conference on Artificial Neural Networks (ICANN) 2014

MEMBERSHIPS

Current memberships

- Member of IEEE (Member ID: 94127451), since January 4, 2017.
- IEEE Computational Intelligence Society (CIS), since January 4, 2017.
- Artificial Intelligence Research Group (AIRGroup Siena - now SAILab), since 2006.

Past memberships

- Association for Computational Linguistics (ACL) from 15/07/2016 to 14/07/2017.
- Italian Association for Artificial Intelligence (AI*IA), Socio Ordinario from 15/09/2011 to 15/09/2012.
- International Neural Network Society (INNS) (Member ID: 3983), from 25/06/2009 to 31/12/2010.
- Società Italiana di Reti Neuroniche (SIREN) from 30/03/2012 to 30/03/2013.

REVIEW ACTIVITY

Journals

- Frontiers in Artificial Intelligence
- Cognitive Computation (Springer)
- The Journal of Machine Learning Research (MIT Press)
- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Neural Networks and Learning Systems
- IEEE Transactions on Cybernetics
- Neurocomputing (Elsevier)
- Pattern Recognition Letters (Elsevier)
- Neural Processing Letters (Springer)
- Information Sciences (Elsevier)
- Pattern Analysis & Applications (Springer)
- Integrated Computer-Aided Engineering (IOS Press)

International Conferences

- **Conferences in which I have been PC member** (previously listed) 2014-oggi
- International Joint Conference on Neural Networks 2018
- International Conference on Image Analysis and Processing 2013
- International Symposium on Neural Networks 2011
- IEEE International Joint Conference on Neural Networks 2010
- International Conference on Artificial Neural Networks 2010
- ACM Conference on Information and Knowledge Management 2009
- International Conference on Artificial Neural Networks 2008
- International Conference on Artificial Neural Networks 2007

COMPUTER SKILLS *Operating Systems*

- Windows (all versions), Linux (various distros, mainly Ubuntu), Mac OS X (currently Mac User). Unix-shell Bash, common scripting commands, text-based-interface text editors (vi, vim), remote management by open-SSH, SVN, GIT.

Programming Languages

- Java (very high skills), C (very high skills), C++, PHP, SQL, Matlab (very high skills and knowledge), Lua, Python, ActionScript (basic experience), JavaScript (basic experience), Pascal, Delphi (basic experience).

Software Packages for Machine Learning

- Torch, PyTorch, TensorFlow (1.x and 2.x).

GPU Programming

- Nvidia CUDA (basic experience).

Multithreading

- POSIX Threads.

Numerical computations optimized by SIMD instructions

- Knowledge of the most common SSE/AVX instructions.

Markup/Representation/Style Languages

- HTML, CSS, XML.

Image and Video Editing

- OpenCV library, very high skills and knowledge in implementing image processing algorithms (even without using OpenCV or other libraries).

Database

- MySQL, DB2, Firebird.

Web Servers

- Apache Web Server.

Development Environment

- Eclipse, NetBeans, Microsoft Visual Studio, DevC++, PyCharm.

Office Application, Graphics, Web

- Knowledge (common user) of the most common office suites, text/web page editing softwares and graphic tools, such as Microsoft Office, OpenOffice/LibreOffice, Adobe Photoshop, Dreamweaver, L^AT_EX.

Misc

- High experience and knowledge of PC components, peripherals and networking.

SOFTWARE
DEVELOPMENT

Cognitive Action Laws (http://www.dii.unisi.it/~melacci/calnn/nn_code_data_params.zip)

- Python + PyTorch implementations of motion-coherence based software [J6] (previously developed using TensorFlow 1.x).

Conversational Agent Bob

- Conversational system that learns language and knowledge while talking with multiple users. The agent is able to perform Logic Reasoning using First-Order Logic. Developed mostly in Java + MySQL [W8].

HTML5 + Javascript Customizable Video Player (http://dva.diism.unisi.it/demo_aristocats.html)

- Generic video player, based on HTML5 and Javascript. It allows the user to customize the visualization by highlighting some frame regions or video portions.

DVA (<http://dva.diism.unisi.it>)

- C++ software for Machine Learning algorithms that process video streams. Online and asynchronous interactions with the outer environment (i.e. users, other softwares).

DVA Viewer (<http://dva.diism.unisi.it>)

- Java software to handle user interaction (sending supervisions) to the DVA software, and to progressively show (on-line) the outcome of the video processing.

- LapSVMp* (<http://www.dii.unisi.it/~melacci/lapsvmp>)
- An efficient Matlab implementation of the primal training of Laplacian Support Vector Machines.
- V.EN.US. System* (<http://venus.dii.unisi.it>)
- A visual tool for the automatic enhancement of face pictures. It is based on artificial intelligence algorithms and on image warping, and it has been used (and evaluated) in public events.
- Active Appearance Model Java Library* (<http://www.dii.unisi.it/~melacci>)
- A powerful Java implementation of the Active Appearance Model algorithm by means of a 3D software renderer.
- ART.I.ST*, ARTificial Intelligence caricaturiST (University of Siena)
- Java software for automatic generation of face caricatures.

EVENTS

I actively participated to the organization of the 2-day event (March 6-7, 2019) where the NLP research laboratory SAINLab was launched. SAINLab is a joint research lab between the company QuestIT S.r.l. (The Digital Box S.p.a.) and the Department of Information Engineering and Mathematics (University of Siena). During the event, I presented the research activities of the Siena Artificial Intelligence Laboratory (SAILab, <http://sailab.diism.unisi.it>).

Since January 2018, I am the organizer of the weekly seminars of the Siena Artificial Intelligence Laboratory (SAILab, <http://sailab.diism.unisi.it>).

I took part in the organization of the public event “*Festival of Creativity*”, held in Florence, ITALY (<http://www.festivaldellacreativita.it>), in December 2006 and October 2007. I was presenting the research activity of the Artificial Intelligence Research Group (University of Siena), and publicly testing the V.EN.US. System.

PUBLICATIONS

Books

- [B1] Alessandro Betti, Marco Gori, and Stefano Melacci. *Deep Learning to See - Towards New Foundations of Computer Vision*. Springer Briefs in Computer Science. Springer, 2022. ISBN 978-3-030-90986-4. DOI: 10.1007/978-3-030-90987-1.

Book Chapters

- [BC1] Giorgio Gnecco, Marco Gori, Stefano Melacci, and Marcello Sanguineti. Learning as constraint reactions. In Petia Koprinkova-Hristova, Valeri Mladenov, and Nikola K. Kasabov, editors, *Artificial Neural Networks*, volume 4 of *Springer Series in Bio-/Neuroinformatics*, pages 245–270, Springer International Publishing, 2015. ISBN 978-3-319-09902-6. DOI: 10.1007/978-3-319-09903-3_12.

Journals

- [J1] Stefano Melacci, Gabriele Ciravegna, Angelo Sotgiu, Ambra Demontis, Battista Biggio, Marco Gori, and Fabio Roli. Domain knowledge alleviates adversarial attacks in multi-label classifiers. *IEEE Transactions on Pattern Analysis and Machine Intelligence (Early Access)*, 2021. DOI: 10.1109/TPAMI.2021.3137564.

- [J2] Matteo Tiezzi, Giuseppe Marra, Stefano Melacci, and Marco Maggini. Deep constraint-based propagation in graph neural networks. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 44(2):727–739, February, 2022. ISSN 1939-3539. DOI: 10.1109/TPAMI.2021.3073504.
- [J3] Alessandro Betti, Giuseppe Boccignone, Lapo Faggi, Marco Gori, and Stefano Melacci. Visual Features and Their Own Optical Flow. *Frontiers in Artificial Intelligence*, 4:1–12, December, 2021. DOI: 10.3389/frai.2021.768516.
- [J4] Lisa Graziani, Marco Gori, and Stefano Melacci. A language modeling-like approach to sketching. *Neural Networks*, 144:627–638, 2021. ISSN 0893-6080. DOI: <https://doi.org/10.1016/j.neunet.2021.09.020>.
- [J5] Dario Zanca, Marco Gori, Stefano Melacci, and Alessandra Rufa. Gravitational models explain shifts on human visual attention. *Scientific Reports*, 10(1), October, 2020. DOI: 10.1038/s41598-020-73494-2.
- [J6] Alessandro Betti, Marco Gori, and Stefano Melacci. Learning visual features under motion invariance. *Neural Networks*, 126:275–299, 2020. DOI: 10.1016/j.neunet.2020.03.013.
- [J7] Alessandro Betti, Marco Gori, and Stefano Melacci. Cognitive action laws: The case of visual features. *IEEE Transactions on Neural Networks and Learning Systems*, 31(3):938–949, March, 2020. ISSN 2162-2388. DOI: 10.1109/TNNLS.2019.2911174.
- [J8] Marco Maggini, Giuseppe Marra, Stefano Melacci, and Andrea Zugarini. Learning in text streams: Discovery and disambiguation of entity and relation instances. *IEEE Transactions on Neural Networks and Learning Systems*, 31(11):4475–4486, November, 2020. DOI: 10.1109/TNNLS.2019.2955597.
- [J9] Francesco Farina, Stefano Melacci, Andrea Garulli, and Antonio Giannitrapani. Asynchronous distributed learning from constraints. *IEEE Transactions on Neural Networks and Learning Systems*, 31(10):4367–4373, October, 2020. ISSN 2162-237X. DOI: 10.1109/TNNLS.2019.2947740.
- [J10] Dario Zanca, Stefano Melacci, and Marco Gori. Gravitational laws of focus of attention. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 42(12):2983–2995, December, 2020. ISSN 2162-2388. DOI: 10.1109/TPAMI.2019.2920636.
- [J11] Lisa Graziani, Stefano Melacci, and Marco Gori. Coherence constraints in facial expression recognition. *Intelligenza Artificiale*, 13(1):79–92, 2019. ISSN 1724-8035. DOI: 10.3233/IA-180015.
- [J12] Marco Gori, Marco Lippi, Marco Maggini, and Stefano Melacci. Semantic video labeling by developmental visual agents. *Computer Vision and Image Understanding*, 146:9–26, 2016. ISSN 1077-3142. DOI: 10.1016/j.cviu.2016.02.011.
- [J13] Giorgio Gnecco, Marco Gori, Stefano Melacci, and Marcello Sanguineti. Foundation of support constraint machines. *Neural Computation*, 27(2):388–480, February, 2015. ISSN 0899-7667. DOI: 10.1162/NECO_a_00686.
- [J14] Giorgio Gnecco, Marco Gori, Stefano Melacci, and Marcello Sanguineti. Learning with mixed hard/soft pointwise constraints. *IEEE Transactions on Neural Networks and Learning Systems*, 26(9):2019–2032, September, 2015. ISSN 2162-237X. DOI: 10.1109/TNNLS.2014.2361866.
- [J15] Giorgio Gnecco, Marco Gori, Stefano Melacci, and Marcello Sanguineti. A theoretical framework for supervised learning from regions. *Neurocomputing*, 129:25–32, April, 2014. ISSN 0925-2312. DOI: 10.1016/j.neucom.2012.06.065.

- [J16] Stefano Melacci and Marco Gori. Learning with box kernels. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 35(11):2680–2692, November, 2013. ISSN 0162-8828. DOI: 10.1109/TPAMI.2013.73.
- [J17] Marco Gori and Stefano Melacci. Constraint verification with kernel machines. *IEEE Transactions on Neural Networks and Learning Systems*, 24(5): 825–831, May, 2013. ISSN 2162-237X. DOI: 10.1109/TNNLS.2013.2241787.
- [J18] Serena Ferroni, Andrea Borracchini, Stefano Melacci, and Tiziana Doldo. Aesthetical standards and new technologies: a comparison. *Virtual Journal of Orthodontics*, 9(4):10–24, December, 2012. ISSN 1128-6547. URL <http://www.vjo.it/9-4/aest/>.
- [J19] Stefano Melacci and Marco Gori. Unsupervised learning by minimal entropy encoding. *IEEE Transactions on Neural Networks and Learning Systems*, 23(12):1849–1861, December, 2012. ISSN 2162-237X. DOI: 10.1109/TNNLS.2012.2216899.
- [J20] Marco Maggini, Stefano Melacci, and Lorenzo Sarti. Learning from pairwise constraints by similarity neural networks. *Neural Networks*, 26:141–158, February, 2012. ISSN 0893-6080. DOI: 10.1016/j.neunet.2011.10.009.
- [J21] Stefano Melacci and Mikhail Belkin. Laplacian support vector machines trained in the primal. *Journal of Machine Learning Research*, 12:1149–1184, March, 2011. ISSN 1533-7928. URL <http://www.jmlr.org/papers/volume12/melacci11a/melacci11a.pdf>.
- [J22] Stefano Melacci, Lorenzo Sarti, Marco Maggini, and Marco Gori. A template-based approach to automatic face enhancement. *Pattern Analysis and Applications*, 13(3):289–300, 2010. ISSN 1433-7541. DOI: 10.1007/s10044-009-0155-0.

International Conferences

- [C1] Simone Marullo, Matteo Tiezzi, Alessandro Betti, Lapo Faggi, Enrico Meloni, and Stefano Melacci. Continual unsupervised learning for optical flow estimation with deep networks. In *Conference on Lifelong Learning Agents, CoLLAs 2022, 22-24 August 2022, McGill University, Montréal, Québec, Canada*, volume 199 of *Proceedings of Machine Learning Research*, pages 183–200. PMLR, 2022. URL <https://proceedings.mlr.press/v199/marullo22a.html>.
- [C2] Alessandro Betti, Lapo Faggi, Marco Gori, Matteo Tiezzi, Simone Marullo, Enrico Meloni, and Stefano Melacci. Continual learning through hamilton equations. In *Conference on Lifelong Learning Agents, CoLLAs 2022, 22-24 August 2022, McGill University, Montréal, Québec, Canada*, volume 199 of *Proceedings of Machine Learning Research*, pages 201–212. PMLR, 2022. URL <https://proceedings.mlr.press/v199/betti22a.html>.
- [C3] Pietro Barbiero, Gabriele Ciravegna, Francesco Giannini, Pietro Lió, Marco Gori, and Stefano Melacci. Entropy-based logic explanations of neural networks. *Proceedings of the AAAI Conference on Artificial Intelligence*, 36(6): 6046–6054, June, 2022. DOI: 10.1609/aaai.v36i6.20551.
- [C4] Simone Marullo, Matteo Tiezzi, Marco Gori, and Stefano Melacci. Being Friends Instead of Adversaries: deep networks learn from data simplified by other networks. *Proceedings of the AAAI Conference on Artificial Intelligence*, 36(7):7728–7735, June, 2022. DOI: 10.1609/aaai.v36i7.20740.
- [C5] Simone Marullo, Matteo Tiezzi, Marco Gori, and Stefano Melacci. Friendly training: Neural networks can adapt data to make learning easier. In *International Joint Conference on Neural Networks (IJCNN)*, pages 1–8, 2021. DOI: 10.1109/IJCNN52387.2021.9534165.

- [C6] Andrea Zugarini, Luca Pasqualini, Stefano Melacci, and Marco Maggini. Generate and Revise: Reinforcement learning in neural poetry. In *International Joint Conference on Neural Networks (IJCNN)*, pages 1–8, 2021. DOI: 10.1109/IJCNN52387.2021.9533573.
- [C7] Enrico Meloni, Matteo Tiezzi, Luca Pasqualini, Marco Gori, and Stefano Melacci. Messing up 3d virtual environments: Transferable adversarial 3d objects. In *IEEE International Conference on Machine Learning and Applications (ICMLA)*, pages 1–8, 2021. DOI: 10.1109/ICMLA52953.2021.00009.
- [C8] Miguel Fabian Romero Rondon, Dario Zanca, Stefano Melacci, Marco Gori, and Lucile Sassatelli. Hemog: A white-box model to unveil the connection between saliency information and human head motion in virtual reality. In *IEEE International Conference on Artificial Intelligence and Virtual Reality (AIVR)*, pages 10–18, 2021. DOI: 10.1109/AIVR52153.2021.00012.
- [C9] Enrico Meloni, Luca Pasqualini, Matteo Tiezzi, Marco Gori, and Stefano Melacci. SAILenv: learning in virtual visual environments made simple. In *2020 25th International Conference on Pattern Recognition (ICPR)*, pages 8906–8913, 2021. DOI: 10.1109/ICPR48806.2021.9412909.
- [C10] Matteo Tiezzi, Stefano Melacci, Alessandro Betti, Marco Maggini, and Marco Gori. Focus of attention improves information transfer in visual features. In H. Larochelle, M. Ranzato, R. Hadsell, M. F. Balcan, and H. Lin, editors, *Advances in Neural Information Processing Systems 33: Annual Conference on Neural Information Processing Systems 2020 (NeurIPS)*, volume 33, pages 22194–22204. Curran Associates, Inc., 2020. URL <https://proceedings.neurips.cc/paper/2020/file/fc2dc7d20994a777cfd5e6de734fe254-Paper.pdf>.
- [C11] Lisa Graziani, Stefano Melacci, and Marco Gori. Generating facial expressions associated with text. In *Lecture Notes in Computer Science - International Conference on Artificial Neural Networks (ICANN)*, volume 12396, pages 621–632, 2020. DOI: 10.1007/978-3-030-61609-0_49.
- [C12] Gabriele Ciravegna, Francesco Giannini, Marco Gori, Marco Maggini, and Stefano Melacci. Human-driven FOL explanations of deep learning. In Christian Bessiere, editor, *Proceedings of the Twenty-Ninth International Joint Conference on Artificial Intelligence, IJCAI-20*, pages 2234–2240. International Joint Conferences on Artificial Intelligence Organization, 7, 2020. DOI: 10.24963/ijcai.2020/309. Main track.
- [C13] Matteo Tiezzi, Giuseppe Marra, Stefano Melacci, Marco Maggini, and Marco Gori. A lagrangian approach to information propagation in graph neural networks. In *Frontiers in Artificial Intelligence and Applications - European Conference on Artificial Intelligence (ECAI) 2020*, volume 325, pages 1539–1546. IOS Press, 2020. DOI: 10.3233/FAIA200262.
- [C14] Alessandro Betti, Marco Gori, Simone Marullo, and Stefano Melacci. Developing constrained neural units over time. In *Proceedings of the International Joint Conference on Neural Networks (IJCNN)*, pages 1–8. IEEE, 2020. DOI: 10.1109/IJCNN48605.2020.9207028.
- [C15] Giuseppe Marra, Matteo Tiezzi, Stefano Melacci, Alessandro Betti, Marco Maggini, and Marco Gori. Local propagation in constraint-based neural networks. In *Proceedings of the International Joint Conference on Neural Networks (IJCNN)*, pages 1–8. IEEE, 2020. DOI: 10.1109/IJCNN48605.2020.9207043.

- [C16] Dario Zanca, Stefano Melacci, and Marco Gori. Toward improving the evaluation of visual attention models: A crowdsourcing approach. In *Proceedings of the International Joint Conference on Neural Networks (IJCNN)*, pages 1–8. IEEE, 2020. DOI: 10.1109/IJCNN48605.2020.9207438.
- [C17] Gabriele Ciravegna, Francesco Giannini, Stefano Melacci, Marco Maggini, and Marco Gori. A constraint-based approach to learning and explanation. In *Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI) 2020*, pages 3658–3665. AAAI Press, 2020. DOI: 10.1609/aaai.v34i04.5774.
- [C18] Alessandro Betti, Marco Gori, and Stefano Melacci. Motion invariance in visual environments. In *Proceedings of the Twenty-Eighth International Joint Conference on Artificial Intelligence, IJCAI-19*, pages 2009–2015. International Joint Conferences on Artificial Intelligence Organization, 7, 2019. DOI: 10.24963/ijcai.2019/278.
- [C19] Lisa Graziani, Stefano Melacci, and Marco Gori. Jointly learning to detect emotions and predict facebook reactions. In Igor V. Tetko, Věra Kůrková, Pavel Karpov, and Fabian Theis, editors, *Artificial Neural Networks and Machine Learning – ICANN 2019: Text and Time Series*, pages 185–197, Cham, 2019. Springer International Publishing. ISBN 978-3-030-30490-4. DOI: 10.1007/978-3-030-30490-4_16.
- [C20] Andrea Zugarini, Stefano Melacci, and Marco Maggini. Neural poetry: Learning to generate poems using syllables. In Igor V. Tetko, Věra Kůrková, Pavel Karpov, and Fabian Theis, editors, *Artificial Neural Networks and Machine Learning – ICANN 2019: Text and Time Series*, pages 313–325, Cham, 2019. Springer International Publishing. DOI: 10.1007/978-3-030-30490-4_26.
- [C21] Lisa Graziani, Stefano Melacci, and Marco Gori. The role of coherence in facial expression recognition. In Chiara Ghidini, Bernardo Magnini, Andrea Passerini, and Paolo Traverso, editors, *AI*IA 2018 - Advances in Artificial Intelligence - XVIIIth International Conference of the Italian Association for Artificial Intelligence, 2018, Proceedings*, volume 11298 of *Lecture Notes in Computer Science*, pages 320–333, Trento, Italy, November 20-23, 2018. Springer. DOI: 10.1007/978-3-030-03840-3_24.
- [C22] Giuseppe Marra, Andrea Zugarini, Stefano Melacci, and Marco Maggini. An unsupervised character-aware neural approach to word and context representation learning. In Vera Kurková, Yannis Manolopoulos, Barbara Hammer, Lazaros S. Iliadis, and Ilias Maglogiannis, editors, *Artificial Neural Networks and Machine Learning - ICANN 2018 - Proceedings, Part III*, volume 11141, pages 126–136, Rhodes, Greece, October 4-7, 2018. ISBN 978-3-030-01423-0. DOI: 10.1007/978-3-030-01424-7_13. 27th International Conference on Artificial Neural Networks.
- [C23] Matteo Tiezzi, Stefano Melacci, Marco Maggini, and Angelo Frosini. Video surveillance of highway traffic events by deep learning architectures. In Vera Kurková, Yannis Manolopoulos, Barbara Hammer, Lazaros S. Iliadis, and Ilias Maglogiannis, editors, *Artificial Neural Networks and Machine Learning - ICANN 2018 - Proceedings, Part III*, volume 11141 of *Lecture Notes in Computer Science*, pages 584–593, Rhodes, Greece, October 4-7, 2018. Springer. ISBN 978-3-030-01423-0. DOI: 10.1007/978-3-030-01424-7_57. 27th International Conference on Artificial Neural Networks.
- [C24] Stefano Melacci, Achille Globo, and Leonardo Rigutini. Enhancing modern supervised word sense disambiguation models by semantic lexical resources. In Nicoletta Calzolari, Khalid Choukri, Christopher Cieri, Thierry Declerck, Sara Goggi, Kôiti Hasida, Hitoshi Isahara, Bente Maegaard, Joseph Mariani,

- H el ene Mazo, Asuncion Moreno, Jan Odijk, Stelios Piperidis, and Takenobu Tokunaga, editors, *11th International Conference on Language Resources and Evaluation (LREC)*, pages 1012–1017, Miyazaki, Japan, May 7-12, 2018. European Language Resources Association (ELRA). ISBN 979-10-95546-00-9.
- [C25] Marco Gori, Marco Lippi, Marco Maggini, Stefano Melacci, and Marcello Pelillo. En plein air visual agents. In Vittorio Murino and Enrico Puppo, editors, *Image Analysis and Processing - ICIAP 2015*, volume 9280 of *Lecture Notes in Computer Science*, pages 697–709, Springer International Publishing. 18th International Conference on Image Analysis and Processing, Genova, Italy, September 7-11, 2015. ISBN 978-3-319-23233-1. DOI: 10.1007/978-3-319-23234-8_64.
- [C26] Salvatore Frandina, Marco Gori, Marco Lippi, Marco Maggini, and Stefano Melacci. Variational foundations of online backpropagation. In Valeri Mladenov, Petia Koprinkova-Hristova, G unther Palm, Alessandro E.P. Villa, Bruno Appollini, and Nikola Kasabov, editors, *Artificial Neural Networks and Machine Learning - ICANN 2013*, volume 8131 of *Lecture Notes in Computer Science*, pages 82–89, Springer Berlin Heidelberg. 23rd International Conference on Artificial Neural Networks, Sofia, Bulgaria, September 10-13, 2013. ISBN 978-3-642-40727-7. DOI: 10.1007/978-3-642-40728-4_11.
- [C27] Salvatore Frandina, Marco Lippi, Marco Maggini, and Stefano Melacci. On—line laplacian one—class support vector machines. In Valeri Mladenov, Petia Koprinkova-Hristova, G unther Palm, Alessandro E.P. Villa, Bruno Appollini, and Nikola Kasabov, editors, *Artificial Neural Networks and Machine Learning - ICANN 2013*, volume 8131 of *Lecture Notes in Computer Science*, pages 186–193, Springer Berlin Heidelberg. 23rd International Conference on Artificial Neural Networks, Sofia, Bulgaria, September 10-13, 2013. ISBN 978-3-642-40727-7. DOI: 10.1007/978-3-642-40728-4_24.
- [C28] Giorgio Gnecco, Marco Gori, Stefano Melacci, and Marcello Sanguineti. Learning with hard constraints. In Valeri Mladenov, Petia Koprinkova-Hristova, G unther Palm, Alessandro E.P. Villa, Bruno Appollini, and Nikola Kasabov, editors, *Artificial Neural Networks and Machine Learning - ICANN 2013*, volume 8131 of *Lecture Notes in Computer Science*, pages 146–153, Springer Berlin Heidelberg. 23rd International Conference on Artificial Neural Networks, Sofia, Bulgaria, September 10-13, 2013. ISBN 978-3-642-40727-7. DOI: 10.1007/978-3-642-40728-4_19.
- [C29] Stefano Melacci, Marco Lippi, Marco Gori, and Marco Maggini. Information-based learning of deep architectures for feature extraction. In Alfredo Petrosino, editor, *Image Analysis and Processing - ICIAP 2013*, volume 8157 of *Lecture Notes in Computer Science*, pages 101–110, Springer Berlin Heidelberg. 17th International Conference on Image Analysis and Processing, Napoli, Italy, September 9-13, 2013. ISBN 978-3-642-41183-0. DOI: 10.1007/978-3-642-41184-7_11.
- [C30] Marco Gori, Stefano Melacci, Marco Lippi, and Marco Maggini. Information theoretic learning for pixel-based visual agents. In Andrew Fitzgibbon, Svetlana Lazebnik, Pietro Perona, Yoichi Sato, and Cordelia Schmid, editors, *Computer Vision - ECCV 2012*, volume 7577 of *Lecture Notes in Computer Science*, pages 864–875, Springer Berlin Heidelberg. 12th European Conference on Computer Vision, Firenze, Italy, October 7-13, 2012. ISBN 978-3-642-33782-6. DOI: 10.1007/978-3-642-33783-3_62.
- [C31] Stefano Melacci and Marco Gori. Kernel methods for minimum entropy encoding. In *Machine Learning and Applications (ICMLA)*, 2011 10th Inter-

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