VENUE
ICIAP 2019 is the 20th edition of a series of conferences organized biennially by the Italian Member Society (CVPL, ex GIRPR) of the International Association for Pattern Recognition (IAPR). All the events of the conference will be held in the Palazzo di Giurisprudenza (Faculty of Law), Trento.

How to reach us
The Palazzo di Giurisprudenza is located in Trento city center, easily reachable on foot from all the main, downtown hotels. ICIAP participants will be welcomed at the Foyer, via Rosmini 27.

Internet Access
Guest wireless accounts can be collected from the Registration Desk.
Participants with an eduroam account can use it directly.
The City
Trento is a beautiful city in the heart of the Dolomites Alps, near Lake Garda. The center has a strong Renaissance mark with several beautiful buildings adorned by frescoes, some built to accommodate delegates to the Council of Trento (1545-1563). The surroundings of Trento offer beautiful naturalistic tracks on top of mountains (e.g., Monte Bondone), around the numerous lakes or nearby ancient castles.

What to do in Trento and around Trento:

- **Buonconsiglio Castle.** This castle is a "must visit" attraction as it represents the main monument of the city.

- **Duomo.** The Duomo of Trento, also known as Saint Vigilius Cathedral is located in the main square of Trento.

- **Palazzo delle Alberie.** A representative villa, built in Renaissance style, that now hosts a permanent modern art museum.

- **Museo diocesano tridentino.** Next to the Duomo, Palazzo Pretorio host a permanent exhibition.

- **Roman underground ruins.** In Piazza Battisti you will find the access to the ruins of the underground ancient Trento built by the Romans. This is actually another city under Trento.

- **MUSE.** The new Science Museum of Trento, open since 27 July 2013. The building itself is a novel architectural structure, designed by Renzo Piano, whose outline recalls the profile of the surrounding mountains.
- **Mountains.** Trento is the hearth of the Dolomites, the mountain range that were declared a UNESCO World Heritage Site in 2009. They can be reached in less than two hours, by public transport or by car.

- **Lakes.** In the Trentino region, several beautiful lakes are reachable in less than one hour by public transport; we mention here only the largest ones (Garda, Caldonazzo, Levico), but several smaller lakes are spread around the region.

[https://www.visittrentino.info/en](https://www.visittrentino.info/en)
**Trentino Guest Card**

At the tourist information offices it is possible to buy the Trentino Guest Card (40€). It allows free circulation on all local public transport, including trains, during the stay and an entry (free or reduced) for each of the 300 services among museums, castles, nature parks and attractions featured on [this list](#). More info at [this link](#).
SOCIAL EVENTS

Reception at the Buonconsiglio Castle

The Buonconsiglio Castle is a museum as well as the largest monumental complex in Trentino-Alto Adige. The Castle built up against the 13th-century city walls served as the residence of the Bishops of Trento from the second half of the 13th century until the secularization of the principality in 1803 and is composed of a series of buildings of different eras, enclosed by walls and positioned slightly higher than the city.

Today it is the seat of the Museo Provinciale d'Arte (Provincial Art Museum), monuments and provincial art collections. It holds numerous collections of art, paintings, sculptures, graphic works, miniate codes, majolica ovens, as well as archaeological and numismatic collections. Among its many Baroque and Gothic frescoes, an outstanding work is the Ciclo dei Mesi (Cycle of the
Months) considered one of the most significant examples of international Gothic style in the world.

The Castle is located in the very center of Trento at a walking distance from the Conference venue.

Castello del Buonconsiglio
Via Bernardo Clesio, 5
Trento - Italia
www.buonconsiglio.it

Banquet at Villa Bortolazzi

Located a short distance from the village of Mattarello, Villa Bortolazzi at Acquaviva will allow visitors to appreciate the evocative eighteenth-century atmospheres enclosed within a building with simple and linear contours built in 1693 by Comacini Apollonio and Pietro Somalvico. Adorned by the vast park, the avenue that runs between two boxwood hedges and a garden decorated with statues of divinities and allegories in silent conversation, the exterior of the villa restores a fascinating Arcadian atmosphere. Once through the threshold, the route will allow you to admire the frescoed 18th-century pictorial decoration, the exuberant stucco cornices and
the dizzying architectural partitions made by the Trentine painter Antonio Gresta and the Modenese Domenico Romani. The halls of the villa are frescoed with mythological, allegorical scenes, heraldic compositions, elaborate eighteenth-century perspective architectures among which we remember the central hall with the Apotheosis of the Sun between the figures of the Seasons, of the wife Neera and of the two daughters who feed the horses of the chariot of the sun made by Antonio Gresta. The delightful Chapel dedicated to the Blessed Virgin Mary of Carmel is enhanced by paintings by G. B. Cignaroli and by the altar attributed to Giuseppe Antonio Sartori.

Villa Bortolazzi is located in Mattarello, a small village at 20 minutes of distance from the Conference venue. There will be buses from and to the conference venue.

Villa Bortolazzi
Località Acquaviva, 10
38123, Mattarello di Trento, TN
http://www.villabortolazzi.it/
### PROGRAM OVERVIEW

<table>
<thead>
<tr>
<th>Time</th>
<th>9 September</th>
<th>10 September</th>
<th>11 September</th>
<th>12 September</th>
<th>13 September</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place</td>
<td>Aula 1</td>
<td>Aula 2</td>
<td>Aula 3</td>
<td>Aula 1</td>
<td>Aula 1</td>
</tr>
<tr>
<td>8:45-9:00</td>
<td>Welcome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:00-10:00</td>
<td>W1</td>
<td>T1</td>
<td>T2</td>
<td>IS</td>
<td>W3</td>
</tr>
<tr>
<td></td>
<td>Davide Scaramuzza</td>
<td>Tal Ayellet</td>
<td>Emanuele Rodola</td>
<td>Alessandra Scuitti</td>
<td></td>
</tr>
<tr>
<td>10:00-11:00</td>
<td>W2</td>
<td>IS</td>
<td>W3</td>
<td>Oral 1</td>
<td>Oral 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CVPL Highlights</td>
<td></td>
</tr>
<tr>
<td>11:00-11:30</td>
<td>Coffee break</td>
<td></td>
<td></td>
<td></td>
<td>Coffee break</td>
</tr>
<tr>
<td>11:30-12:30</td>
<td>W1</td>
<td>T4</td>
<td>T3</td>
<td>W2</td>
<td>IS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>W3</td>
<td>Post 1</td>
</tr>
<tr>
<td>12:30-13:00</td>
<td></td>
<td></td>
<td></td>
<td>Oral 4</td>
<td>CVPL Highlights</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lunch break</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:00-14:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:30-15:30</td>
<td>W1</td>
<td>T5</td>
<td>W4</td>
<td>IS</td>
<td>T6</td>
</tr>
<tr>
<td></td>
<td>Oral 2</td>
<td>Spotlight 1</td>
<td></td>
<td></td>
<td>Poster 3</td>
</tr>
<tr>
<td>15:30-16:30</td>
<td></td>
<td></td>
<td>DAFNE Challenge</td>
<td>Poster 4</td>
<td></td>
</tr>
<tr>
<td>16:30-17:00</td>
<td>Coffee break</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:00-18:30</td>
<td>W1</td>
<td>W4</td>
<td></td>
<td>Poster 2</td>
<td>CVPL Meeting</td>
</tr>
<tr>
<td>18:30-19:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19:00-20:00</td>
<td>Welcome Reception (Castello del Buonconsiglio)</td>
<td></td>
<td></td>
<td>Social Dinner (Villa Bontolazza, Acquaviva)</td>
<td></td>
</tr>
<tr>
<td>20:00-22:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Tutorial and Workshops, 9-10 September

### Monday, September 9

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00 - 11:00</td>
<td>Workshop W1 + Tutorials T1 - T2</td>
</tr>
<tr>
<td>11:00 - 11:30</td>
<td>Coffee break</td>
</tr>
<tr>
<td>11:30 - 13:00</td>
<td>Workshop W1 + Tutorials T3 - T4</td>
</tr>
<tr>
<td>13:00 - 14:30</td>
<td>Lunch</td>
</tr>
<tr>
<td>14:30 - 16:30</td>
<td>Workshops W1 + Tutorial T5</td>
</tr>
<tr>
<td>16:30 - 17:00</td>
<td>Coffee break</td>
</tr>
<tr>
<td>17:00 - 19:00</td>
<td>Workshops W1</td>
</tr>
</tbody>
</table>

### Tuesday, September 10

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00 - 11:00</td>
<td>Workshop W2 and W3</td>
</tr>
<tr>
<td>09:00 - 11:00</td>
<td>Industrial Session</td>
</tr>
<tr>
<td>11:00 - 11:30</td>
<td>Coffee break</td>
</tr>
<tr>
<td>11:30 - 13:00</td>
<td>Workshop W2 and W3</td>
</tr>
<tr>
<td>11:30 - 13:00</td>
<td>Industrial Session</td>
</tr>
<tr>
<td>13:00 - 14:30</td>
<td>Lunch</td>
</tr>
<tr>
<td>14:30 - 16:30</td>
<td>Workshop W4 + Tutorial T6</td>
</tr>
<tr>
<td>14:30 - 16:30</td>
<td>Industrial Session</td>
</tr>
<tr>
<td>16:30 - 17:00</td>
<td>Coffee break</td>
</tr>
<tr>
<td>17:00 - 19:00</td>
<td>Workshop W4</td>
</tr>
<tr>
<td>20:00 - 22:30</td>
<td>Reception ICIAP - Banquet ICDSC</td>
</tr>
</tbody>
</table>
Main Conference, 11-13 September

Wednesday, September 11

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:45 - 09:00</td>
<td>Welcome</td>
</tr>
<tr>
<td>09:00 - 10:00</td>
<td>Invited Talk 1: Davide Scaramuzza</td>
</tr>
<tr>
<td>10:00 - 11:00</td>
<td>Oral 1 (shared with ICDSC)</td>
</tr>
<tr>
<td>11:00 - 11:30</td>
<td>Poster 1 + Coffee break</td>
</tr>
<tr>
<td>11:30 - 13:00</td>
<td>Poster 1</td>
</tr>
<tr>
<td>13:00 - 14:30</td>
<td>Lunch</td>
</tr>
<tr>
<td>14:30 - 15:30</td>
<td>Oral 2 - Image Analysis, Detection and Recognition</td>
</tr>
<tr>
<td>15:30 - 16:00</td>
<td>Spotlight 1</td>
</tr>
<tr>
<td>16:00 - 16:30</td>
<td>DAFNE Challenge Session</td>
</tr>
<tr>
<td>16:30 - 17:00</td>
<td>Poster 2 + Coffee break</td>
</tr>
<tr>
<td>17:00 - 18:30</td>
<td>Poster 2</td>
</tr>
</tbody>
</table>

Thursday, September 12

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00 - 10:00</td>
<td>Invited Talk 2: Tal Ayellet</td>
</tr>
<tr>
<td>10:00 - 11:00</td>
<td>Oral 3 - Deep Learning</td>
</tr>
<tr>
<td>11:00 - 11:30</td>
<td>Coffee break</td>
</tr>
<tr>
<td>11:30 - 12:30</td>
<td>Oral 4 - Brave New Ideas</td>
</tr>
<tr>
<td>12:30 - 13:00</td>
<td>Spotlight 2</td>
</tr>
<tr>
<td>13:00 - 14:30</td>
<td>Lunch</td>
</tr>
<tr>
<td>14:30 - 16:30</td>
<td>Poster 3</td>
</tr>
<tr>
<td>16:30 - 17:00</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>17:00 - 19:00</td>
<td>CVPL Meeting</td>
</tr>
<tr>
<td>20:00 - 22:30</td>
<td>Conference Banquet</td>
</tr>
</tbody>
</table>
### Friday, September 13

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00 - 09:45</td>
<td>Invited Talk 3: Emanuele Rodolà</td>
</tr>
<tr>
<td>09:45 - 10:30</td>
<td>Invited Talk 4: Alessandra Sciutti</td>
</tr>
<tr>
<td>10:30 - 11:00</td>
<td>CVPL Highlights 1</td>
</tr>
<tr>
<td>11:00 - 11:30</td>
<td>Coffee break</td>
</tr>
<tr>
<td>11:30 - 13:00</td>
<td>CVPL Highlights 2</td>
</tr>
<tr>
<td>12:00 - 13:00</td>
<td>Oral 5 - Applications</td>
</tr>
<tr>
<td>13:00 - 14:30</td>
<td>Lunch</td>
</tr>
<tr>
<td>14:30 - 16:30</td>
<td>Poster 4</td>
</tr>
</tbody>
</table>
TUTORIALS

T1  - Vision, Language and Action: from Captioning to Embodied AI
Organizers: Lorenzo Baraldi, Marcella Cornia, Massimiliano Corsini

When:   Monday, September 9, 9:00-11:00
Where:  Aula 2

Abstract: Recent progress in the Computer Vision and Natural Language Processing communities have made it possible to connect Vision, Language and Action together, achieving significant advancements in a variety of tasks which lie at the intersection of Vision, Language and Embodied AI. Those tasks range from generating meaningful descriptions of images, to answering questions and navigating agents in unseen environments via natural language instructions. This tutorial will give a comprehensive guide through these advancements, including state-of-the-art techniques for image and video captioning, cross-modal retrieval and visual question answering. It will then discuss how these approaches can be used on embodied agents which can interact with the physical world, for navigation and for other embodied tasks such as recognition and embodied question answering.

T2  - Transferring Knowledge Across Domains: an Introduction to Deep Domain Adaptation
Organizers: Massimiliano Mancini, Pietro Morerio

When:   Monday, September 9, 9:00-11:00
Where:  Aula 3

Abstract: A standard assumption of learning based models is that training and test data share the same input distribution. However, models trained on given databases perform poorly when tested on data acquired in different
settings. This problem is known as domain shift and is particularly relevant e.g. for visual models of agents acting in the real world or when we have no labeled data available for our target scenario. In the last case, for instance, we could use synthetically generated data to obtain a database for our target task. However, this will create a mismatch between training (synthetic) and test (real) images. Filling the gap between these two different input distributions is the goal of domain adaptation (DA) algorithms. In particular, the goal of DA is to produce a model for a target domain (for which we have few or no labeled data) by exploiting labeled data available in a different, source, domain. Various DA techniques have been developed to address the domain shift problem. In this tutorial, we will provide an introduction to these algorithms and to domain adaptation in general. In particular, we will first introduce the domain shift problem, showing application scenarios where it is strongly present. Then we will provide an overview of the algorithms that have been developed to tackle this issue. In particular, we will focus on the last research trends addressing the DA problem within deep neural networks. Finally, we will compare the positive and negative aspects of these works, showing the current limits and giving insights about the open problems in DA.

T3 - Fingerprint Presentation Attacks Detection: lessons learned and a ROADMAP to the Future
Organizer: Gian Luca Marcialis

When: Monday, September 9, 11:30-13:00
Where: Aula 3

Abstract: More than 15 years have passed when, between 2001 and 2002, the first scholars pointed out the vulnerability of the fingerprint electronic capture devices to possible "attacks" by artificial replicas of the fingers, named "fake fingers" or "gummy fingers", impossible to distinguish from "live fingers" without appropriate "detectors" or simply by visual inspection of the fingerprint image. From then, many possible countermeasures reported in journals, conference proceedings and international projects, have led to a more rigorous approach from the scientific community. This involved the initial terminology too: today, the terms "fingerprint vitality" or "fingerprint
“liveness” detection are included in the large field of the “presentation attacks” detection. The goal of this half-day tutorial is to explore the state of the art on this topic, emphasized by the long-time experience of the Biometric Unit of the PRA Lab (Pattern Recognition and Applications Laboratory) in this activity since from 2003. Our aim is to list and explain the main lessons learned, and trace a possible roadmap for future research works that we want to share with the tutorial participants.

T4 - Probabilistic and deep learning for regression in computer vision
Organizers: Xavier Alameda-Pineda, Stéphane Lathuilière

When: Monday, September 9, 11:30-13:00
Where: Aula 2

Abstract: Regression techniques are widely employed to solve tasks where the goal is to predict continuous values. In computer vision, regression techniques span a large ensemble of applicative scenarios such as: head-pose estimation, facial landmark detection, human pose estimation, age estimation, or image registration. Deep learning revolutionized data science, and recently its popularity has grown exponentially, as did the amount of papers employing deep networks, also for regression. Indeed, vanilla classification convolutional networks (ConvNets), i.e. several convolutional layers, generally followed by a few fully-connected layers, and a classification softmax layer, are often used for regression by replacing the softmax layer with a fully connected regression layer with linear or sigmoid activations. More complex, task-dependent, models also appeared, for instance, cascaded deep regression. In parallel, probabilistic models are still intensively used for regression mostly in two ways. First, in cases where deep learning architectures are not suitable (i.e. the task requires a time-varying output size or the available data set is small). Second, in combination with deep learning architectures. In this course we will first describe the basics of regression, probabilistic regression and deep regression. We will present recent results of these methodologies when tackling different computer vision applications such as tracking, pose or gaze estimation. We will then
provide practical recommendations for using vanilla ConvNets for regression. After, we will provide details on recent methods combining deep architectures and probabilistic models for regression. Finally, we will present how generative models can be conditioned on continuous values. In particular, we will focus on adversarial approaches for high quality image generation. We will introduce the problem of generating person and face images conditioned on a given continuous value (e.g. pose or facial expression). In these cases, generation suffers from pixel-to-pixel misalignments and other perturbation problems that can be duly addressed with recent state-of-the-art methodologies. We will present how these approaches can be extended to video generation and, in particular, image animation.

T5 - Anomaly Detection in Images
Organizers: Giacomo Boracchi, Diego Carrera

When: Monday, September 9, 14:30-16:30
Where: Aula 2

Abstract: Anomaly detection problems are ubiquitous in engineering: the prompt detection of anomalies is often a primary concern, since these might provide precious information for understanding the dynamics of a monitored process and for activating suitable countermeasures. In fact, anomalies are typically the most informative samples in an image (e.g., defects in images used for quality control) or in data streams (e.g., arrhythmias in ECG tracing or frauds in credit card transactions). Not surprisingly, detection problems have been widely investigated in the image analysis and pattern recognition communities and are key in application scenarios ranging from quality inspection to health monitoring.

The tutorial presents a rigorous formulation of the anomaly-detection problem that fits many image analysis techniques and applications. The tutorial describes in detail the most important approaches in the literature, following the machine-learning perspective of supervised, semi-supervised and unsupervised monitoring tasks. Special emphasis will be given to anomaly detection methods based on learned models, which are often adopted to handle images and signals. These include deep learning models,
in particular CNNs, as well as dictionaries yielding (convolutional) sparse representations.

The tutorial is accompanied by various examples where anomaly detection algorithms are applied to solve real world problems. These include visual quality inspection algorithms to monitor chip manufacturing and nanofiber production, as well as algorithms to detect arrhythmia in ECG tracings.

T6 - High-Dynamic-Range imaging: improvements and limits
Organizer: Alessandro Rizzi

When: Tuesday, September 10, 14:30-16:30
Where: Aula 3

Abstract: High Dynamic Range (HDR) imaging is a continuously evolving part of Imaging. Twenty years ago HDR used multiple exposures to attempt to capture a wider range of scene information (Debevec-Malik’s program and Fairchild’s Survey). Ten-plus years ago interest evolved to recreating HDR scenes by integrating widely-used LCD with LED illumination (Helge Seetzen’s Brightsides Displays). Today, the evolution continues in the current sales of HDR televisions using OLED and Quantum Dot technologies. As well, standards for HDR video media formats remain an active area of research. This tutorial reviews the science and technology underlying the evolution of HDR imaging from silver-halide photography to HDR TVs. One emphasis will be on measuring the actual physical limitations of scene capture, scene display, and most important the interaction of these systems with human vision. It is easy to forget that vision is itself a high-dynamic-range sensor with very sophisticated spatial-image-processing algorithms. A second emphasis will be on the differences between single-pixel and spatial comparison HDR algorithms.

After a detailed description of the dynamic range problem in image acquisition, this course focuses on standard methods of creating and manipulating HDR images, replacing myths with scene measurements, camera images, and visual appearances. The course presents measurements about the limits of accurate camera acquisition (range and color) and the
usable range of light for displays presented to human vision. It discusses the principles of tone rendering and the role of HDR spatial comparisons.
WORKSHOPS

W1 - International Workshop on Pattern Recognition for Cultural Heritage (PatReCH 2019)
Organizers: Francesco Fontanella, Mario Molinara, Filippo Stanco

When: Monday, September 9, Full day
Where: Aula 1

Abstract: The aim of this workshop is to present recent advances in Pattern Recognition (PR) techniques for data analysis and representation in the cultural heritage field. Bringing together the work of many experts in this multidisciplinary subject to highlight these advances from a wide-angle perspective, as well as to stimulate new theoretical and applied research for better characterizing the state of the art in this subject.

W2 - Deep Understanding of Shopper Behaviours and Interactions in Intelligent Retail Environment
Organizers: Emanuele Frontoni, Sebastiano Battiato, Cosimo Distante, Marina Paolanti, Luigi di Stefano, Giovanni Maria Farinella, Anette Wolfrath, Primo Zingaretti

When: Tuesday, September 10, 9:00-13:00
Where: Aula 1

Abstract: In retail environments, understanding consumer behaviour is of great importance and one of the keys to success for retailers. While the retail environment has several favourable characteristics that support computer vision, such as reasonable lighting, the large number and diversity of products sold, as well as the potential ambiguity of shoppers' movements, mean that accurately measuring shopper behaviour is still challenging. Over the past years, machine-learning and feature-based tools for people counting as well as interactions analytic and re-identification were developed with the aim of
learning shopper skills. However, after moving into the era of multimedia big data, machine-learning approaches evolved into deep learning approaches, which are a more powerful and efficient way of dealing with the complexities of human behaviour. The goal of this workshop is to encourage and highlight novel strategies and original research in computer vision and pattern recognition for shoppers’ behavior understanding, building a network between European universities and industries and a roadmap for future deep learning applications.

W3 - BioFor Workshop on Recent Advances in Digital Security: Biometrics and Forensic
Organizers: Daniel Riccio, Chang-Tsun Li, Francesco Marra, Diego Gragnaniello

When: Tuesday, September 10, 9:00-13:00
Where: Aula 3

Abstract: Governments and organizations across the world are increasingly adopting digital forensic tools and biometric technologies to face identification frauds, civil crimes, and terrorism. Along this line, a big effort has been spent to promote worldwide adoption of biometric identification documents such as biometric e-passport, bank cards, etc. Although the goals of biometrics and forensics are different, they are both aimed at supporting law enforcement and investigation by exploiting technologies that change and evolve on a daily basis. Increasingly, new scenarios arise where techniques designed for biometrics can be utilized for forensic purposes, or vice-versa. This is the case of multiple face or fingerprint images captured with low-quality devices, which can be processed with super resolution techniques to reconstruct a high resolution image. In a similar way, sketches drawn by forensic artists based on witnesses’ description can be treated with hallucination techniques to tentatively identify the subject.

The 2nd International Workshop on Recent Advances in Digital Security: Biometrics and Forensics (BioFor 2019) focuses on the ongoing research in the fields of security, forensics, and biometrics, which include many key sectors like Forensics Analysis, Watermarking & Data Hiding, Steganography,
Surveillance, Biometrics and Soft Biometrics, Biometric analysis of crime scene traces, etc. It also aims to be an international forum where scientists and researchers can develop synergies between the biometrics and forensic research areas.

W4 - 1st International Workshop on eHealth in the Big Data and Deep Learning Era
Organizers: Tanmoy Chakraborty, Stefano Marrone, Giancarlo Sperlì

When: Monday, September 9, 14:30-19:00
Where: Aula 1

Abstract: Nowadays, data collection and analysis are becoming more and more important in a variety of application domains, as long as the novel technologies advance. In the healthcare domain, biomedical image processing is one of the research fields that has benefitted the most by the new availability of big sources of data and recent successes in automated data processing, becoming one of the most known and active producers of digital information.
Different studies show how the quantity of produced electronic data is increasing over time, with some recent estimates indicating it to exceed the Yottabyte size within the next years.
If the growing amount of available data will help the design of effective diseases prevention and therapies assessment procedures, it may result in an increased effort that physicians have to spend to perform a diagnosis. The task is made even more difficult by high inter/intra patients variability, the availability of different image acquisition techniques and the need of being able to take into account media coming from different sensors and sources.
To face this problem, nowadays, radiologists make use of tools that assist in the analysis of biomedical images: these instruments are known as Computer-Aided Detection and Diagnosis (CAD) and, supported by an appropriate and proved medical validity, are widely used in the analysis of complex medical investigations both for the extension of data to be taken into account (MRI\TC\PET) and for an intrinsic uncertainty of the data due to the scanning process (such as UltraSound scans- US).
CAD systems analyze data using strict mathematical patterns, according to well-defined and deterministic algorithms. This characteristic allows to
remove the difficulties due to inter- and intraobserver variability, represented by different evaluations of the same region, under the same assumptions, by the same doctor on different moments, and different evaluations of the same region by different doctors.

The aim of this workshop is to gather recent advances in the biomedical images processing field to help advance the scientific research within the broad field of medical imaging using machine learning, deep learning and big data techniques. In particular, the aim is to analyze how these techniques can be applied to the entire medical images processing chain, from acquisition to image retrieval, from segmentation to disease prediction.
INDUSTRIAL SESSION
Session Chairs: Luigi Di Stefano, Vittorio Murino, Paolo Rota, Francesco Setti

When: Tuesday, September 10
Where: Aula 2

Abstract: Machine vision is pervasive in industrial applications since the early years of automation, with decades of successful stories associated with a variety of relevant tasks such as quality control, robotic pick & place and AGVs. With respect to general purpose computer vision, industrial machine vision is usually characterized by a more structured environment (controlled lighting conditions, 3D models of target objects) as well as stronger constraints in terms of real-time image processing, robustness, and reliability. With the advancement in sensing and computational resources we are experiencing in the last years, we see potential for further automation in industry providing new opportunities in many fields of research. While the interest is extremely high from industrial stakeholders and academic industrial engineers, witnessed by many events like forums and exhibitions, there is no dedicated event within the academic computer science community. As a result, we experience an unprecedented misalignment between the hot topics in major computer vision conferences and the actual industrial needs. In this Industrial Session we will bring together researchers and practitioners in industrial engineering and computer science interested in industrial machine vision to overview the state of the art and identify the most promising research lines. We welcome contributions involving traditional and non-conventional vision (e.g. IR and X-ray), visual inspection, real-time computer vision, 3D reconstruction and vision for robotics, etc..
CONFERENCE DAILY PROGRAM

Wednesday, September 11

08:45 - 09:00
Welcome

09:00 - 10:00
Invited Talk 1 : Davide Scaramuzza

10:00 - 11:00
Oral Session 1 (shared with ICDSC)

1. Drone patrolling with reinforcement learning
   Claudio Piciarelli (University of Udine); Gian Luca Foresti
   (University of Udine)

   Christophe Bobda (University of Florida); Andrew Felder
   (University of Arkansas); Dillon VanBuskirk (University of Arkansas)

3. RE-OBJ: Jointly learning the foreground and background for object instance re-identification
   Vaibhav Bansal (iit); Stuart James (Istituto Italiano di Tecnologia (IIT)); Alessio Del Bue (Istituto Italiano di Tecnologia (IIT))

4. Open set recognition for unique person counting via virtual gates
   Francesco Turchini (University of Florence); Matteo Bruni
11:00 - 11:30
Coffee Break

11:00 - 13:00
Poster Session 1

   Matteo Stefanini (University of Modena and Reggio Emilia); Marcella Cornia (University of Modena and Reggio Emilia); Lorenzo Baraldi (University of Modena and Reggio Emilia); Massimiliano Corsini (University of Modena and Reggio Emilia); Rita Cucchiara (University of Modena and Reggio Emilia)

2. An Efficient Approximate kNN Graph Method for Diffusion on Image Retrieval
   Federico Magliani (IMP lab - University of Parma); Kevin McGuinness (DCU); Eva Mohedano (Insight Center for Data Analytics); Andrea Prati (University of Parma)

3. Label propagation guided by hierarchy of partitions for superpixel computation
   Carolina Jeronimo (PUC Minas); Jean Cousty (ESIEE); Benjamin Perret (ESIEE/PARIS); Zenilton Patrocínio Jr (PUC Minas); Silvio Guimaraes (PUC Minas)

4. Manual Annotations on Depth Maps for Human Pose Estimation
   Andrea D’Eusanio (University of Modena and Reggio Emilia); Stefano Pini (University of Modena and Reggio Emilia); Guido Borghi (University of Modena and Reggio Emilia); Roberto Vezzani (University of Modena and Reggio Emilia, Italy); Rita Cucchiara (University of Modena and Reggio Emilia)

5. Disparity Image Analysis for 3D Characterization of Surface

29
6. Lightweight deep learning pipeline for detection, segmentation and classification of breast cancer anomalies
   Hugo S Oliveira (FCUP)

7. Geometry-based Skin Colour Estimation for Bare Torso Surface Reconstruction
   João Pedro Monteiro (Departamento de Engenharia Eletrotécnica e de Computadores, Faculdade de Engenharia, Universidade do Porto); Hooshiar Zolfagharnasab (Departamento de Engenharia Eletrotécnica e de Computadores, Faculdade de Engenharia, Universidade do Porto); Helder Pinto de Oliveira (Departamento de Ciência de Computadores, Faculdade de Ciências, Universidade do Porto)

   Ricardo J Araújo (INESC TEC)

9. Low-complexity scene understanding network
   Livia A Iordache (Arnia); Vlad Paunescu (Arnia); Andrei S Leica (Arnia); ByeongMoon Jeon (LG Electronics); Wonjun Kang (LG Electronics); Joonhyung Kwon (LG Electronics)

10. Image anomaly detection with capsule networks and imbalanced datasets
    Claudio Piciarelli (University of Udine); Pankaj Mishra (University of Udine); Gian Luca Foresti (University of Udine)

11. Improving Facial Emotion Recognition Systems with Crucial Feature Extractors
    Ram K Pandey (Indian Institute of Science); Souvik Karmakar (Indian Institute of Science); Ramakrishnan A G (Indian Institute of Science); Nabagata Saha (NIT Warangal)

12. A region proposal approach for cells detection and counting from microscopic blood images
Andrea Loddo (University of Cagliari); Cecilia Di Ruberto (University of Cagliari); Lorenzo Putzu (University of Cagliari)

Sarra Zaied (CentraleSupélec); Catherine Soladie (IETR/CentralSupelec); Pierre-Yves Richard (IETR/CentralSupelec)

14. Easing Function as a Tool of Color Correction for Display Stitching in Virtual Reality
Dariusz Sawicki (Warsaw University of Technology); Agnieszka Wolska (Central Institute for Labour Protection-National Research Institute); Mariusz Wiselka (Central Institute for Labour Protection-National Research Institute); Szymon Ordysinski (Central Institute for Labour Protection-National Research Institute)

15. Towards Multiple Sources Semantic Segmentation
Paolo Russo (Sapienza University of Rome); Tatiana Tommasi (Politecnico di Torino); Barbara Caputo (Politecnico di Torino)

16. On Image Enhancement for Unsupervised Image Description and Matching
Michela Lecca (Fondazione Bruno Kessler (FBK)); Alessandro Torresani (Fondazione Bruno Kessler (FBK)); Fabio Remondino (Fondazione Bruno Kessler (FBK))

17. A Novel Anomaly Score for Isolation Forests
Antonella Mensi (University of Verona); Manuele Bicego (University of Verona)

18. Learning Pedestrian Detection from VirtualWorlds
Giuseppe Amato (CNR-ISTI); Luca Ciampi (CNR-ISTI); Fabrizio Falchi (CNR-ISTI); Claudio Gennaro (CNR-ISTI); Nicola Messina (CNR)

19. Sentiment Analysis from Images of Natural Disasters
Kashif Ahmad (Hamad Bin Khalifa University); Zohaib Hassan (University of Trento); Nicola Conci (University of Trento); Ala Al-Fuqaha (HBKU)
20. **Adaptive Hybrid Representation for Graph-Based Semi-supervised Classification**
   Fadi Dornaika (University of the Basque Country); Alireza Bosaghzadeh (Shahid Rajaee Teacher Training University)

21. **Real-time neurodegenerative disease video classification with severity prediction**
   Vincenzo Dentamaro (University of Bari Aldo Moro); Donato Impedovo (University of Bari Aldo Moro); Giuseppe Pirlo (University of Bari Aldo Moro)

22. **Gesture Recognition by Leap Motion Controller and LSTM Networks for CAD-oriented Interfaces**
   Lisa Mazzini (University of Bologna); Annalisa Franco (University of Bologna); Davide Maltoni (University of Bologna)

23. **VEDI: Vision Exploitation for Data Interpretation**
   Giovanni Maria Farinella (University of Catania); Giovanni Signorello (University of Catania); Sebastiano Battiato (University of Catania); Antonino Furnari (University of Catania); Francesco Ragusa (University of Catania); Rosario Leonardi (University of Catania); Emanuele Ragusa (Xenia Gestione Documentale s.r.l. - Xenia Progetti s.r.l.); Emanuele Scuderi (Xenia Gestione Documentale s.r.l. - Xenia Progetti s.r.l.); Antonino Lopes (Xenia Gestione Documentale s.r.l. - Xenia Progetti s.r.l.); Luciano Santo (Xenia Gestione Documentale s.r.l. - Xenia Progetti s.r.l.); Marina Samarotto (Xenia Gestione Documentale s.r.l. - Xenia Progetti s.r.l.)

24. **Thick line segment detection with fast directional tracking**
   Philippe Even (LORIA); Hoai Ngo (Loria); Bertrand Kerautret (LIRIS)

25. **SWIR Camera-Based Localization and Mapping in Challenging Environments**
   Viacheslav Kachurka (Université d'Évry); David Roussel (Université d'Évry); Hicham Hadj-Abdelkader (Université d'Évry); Fabien Bonardi (Université d'Évry); Jean-Yves Didier (Université d'Évry); Samia Bouchafa (Université d'Évry)
13:00 - 14:30
Lunch

14:30 - 15:30
Oral Session 2 - Image Analysis, Detection and Recognition

1. Relation, Transition and Comparison between the Adaptive Nearest Neighbor Rule and the Hypersphere Classifier
   Mauricio Orozco-Alzate (Universidad Nacional de Colombia); Sisto Baldo (University of Verona); Manuele Bicego (University of Verona)

2. Texture Retrieval in the Wild through Detection-based Attributes
   Christian Joppi (University of Verona); Marco Godi (University of Verona); Andrea Giachetti (TBA); Fabio Pellacini (Sapienza University of Rome); Marco Cristani (University of Verona)

3. Autocropping: A Closer Look at Benchmark Datasets
   Luigi Celona (University of Milano - Bicocca); Gianluigi Ciocca (University of Milano - Bicocca); Paolo Napoletano (University of Milano - Bicocca); Raimondo Schettini (University of Milano - Bicocca)

4. Domain Adaptation for Privacy-preserving Person Detection in Thermal Imagery
   My Kieu (University of Florence); Andy Bagdanov (University of Florence); Marco Bertini (University of Florence); Alberto Del Bimbo (University of Florence)

15:30 - 16:00
Spotlight Session 1
1. Hand Detection using Zoomed Neural Networks
   Sergio R Cruz (City University of Hong Kong); Antoni Chan (City University of Hong Kong, Hong, Kong)

2. Wafer Defect Map Classification Using Sparse Convolutional Networks
   Roberto Di Bella (Politecnico di Milano); Diego Carrera (STMicroelectronics); Beatrice Rossi (STMicroelectronics); Pasqualina Fragneto (STMicroelectronics); Giacomo Boracchi (Politecnico di Milano)

3. Video-Based Convolutional Attention for Person Re-Identification
   Marco Zamprogno (University of Udine); Marco Passon (University of Udine); Niki Martinel (University of Udine); Giuseppe Serra (University of Udine); Giuseppe Lancioni (University of Udine); Christian Micheloni (University of Udine); Carlo Tasso (University of Udine); Gian Luca Foresti (University of Udine)

4. GADA: Generative Adversarial Data Augmentation for Image Quality Assessment
   Pietro Bongini (University of Florence); Riccardo Del Chiaro (University of Florence); Andy Bagdanov (University of Florence); Alberto Del Bimbo (University of Florence)

5. Variational Autoencoder inspired by Brain's Convergence-Divergence Zones for Autonomous Driving Application
   Alice Plebe (University of Trento); Mauro Da Lio (University of Trento)
6. Learning an Optimisable Semantic Segmentation Map with Image Conditioned Variational Autoencoder
Pengcheng Zhuang (Keio University); Yusuke Sekikawa (Keio University); Hideo Saito (Keio University)

7. 3D Shape Segmentation with Geometric Deep Learning
Davide Boscaini (Fondazione Bruno Kessler (FBK)); Fabio Poiesi (Fondazione Bruno Kessler (FBK))

8. 3TP-CNN: Radiomics and Deep Learning for Lesions Classification in DCE-MRI
Michela Gravina (University of Naples Federico II); Stefano Marrone (University of Naples Federico II); Gabriele Piantadosi (University of Naples Federico II); Mario Sansone (University of Naples Federico II); Carlo Sansone (University of Naples Federico II)

9. Deep Compact Person Re-Identification with Distractor Synthesis via Guided DC-GANs
Víctor Ponce-López (University of Bristol); Tilo Burghardt (University of Bristol); Yue Sun (University of Bristol); Sion Hannuna (University of Bristol); Dima Damen (University of Bristol); Majid Mirmehdi (University of Bristol)

16:00 - 16:30
DAFNE Challenge Session

16:30 - 17:00
Coffee Break

16:30 - 18:30
Poster Session 2

35
1. Hand Detection using Zoomed Neural Networks
Sergio R Cruz (City University of Hong Kong); Antoni Chan (City University of Hong Kong)

2. Wafer Defect Map Classification Using Sparse Convolutional Networks
Roberto Di Bella (Politecnico di Milano); Diego Carrera (STMicroelectronics); Beatrice Rossi (STMicroelectronics); Pasqualina Fragneto (STMicroelectronics); Giacomo Boracchi (Politecnico di Milano)

3. Video-Based Convolutional Attention for Person Re-Identification
Marco Zamprogno (University of Udine); Marco Passon (University of Udine); Niki Martinel (University of Udine); Giuseppe Serra (University of Udine); Giuseppe Lancioni (University of Udine); Christian Micheloni (University of Udine); Carlo Tasso (University of Udine); Gian Luca Foresti (University of Udine)

4. GADA: Generative Adversarial Data Augmentation for Image Quality Assessment
Pietro Bongini (University of Florence); Riccardo Del Chiaro (University of Florence); Andy Bagdanov (University of Florence); Alberto Del Bimbo (University of Florence)

5. Variational Autoencoder inspired by Brain's Convergence-Divergence Zones for Autonomous Driving Application
Alice Plebe (University of Trento); Mauro Da Lio (University of Trento)
6. Learning an Optimisable Semantic Segmentation Map with Image Conditioned Variational Autoencoder
   Pengcheng Zhuang (Keio University); Yusuke Sekikawa (Keio University); Hideo Saito (Keio University)

7. 3D Shape Segmentation with Geometric Deep Learning
   Davide Boscaini (Fondazione Bruno Kessler (FBK)); Fabio Poiesi (Fondazione Bruno Kessler (FBK))

8. 3TP-CNN: Radiomics and Deep Learning for Lesions Classification in DCE-MRI
   Michela Gravina (University of Naples Federico II); Stefano Marrone (University of Naples Federico II); Gabriele Piantadosi (University of Naples Federico II); Mario Sansone (University of Naples Federico II); Carlo Sansone (University of Naples Federico II)

9. Deep Compact Person Re-Identification with Distractor Synthesis via Guided DC-GANs
   Víctor Ponce-López (University of Bristol); Tilo Burghardt (University of Bristol); Yue Sun (University of Bristol); Sion Hannuna (University of Bristol); Dima Damen (University of Bristol); Majid Mirmehdi (University of Bristol)

10. A Gradient-based Spatial Color Algorithm for Image Contrast Enhancement
    Michela Lecca (Fondazione Bruno Kessler (FBK))

11. Video synthesis from Intensity and Event Frames
    Stefano Pini (University of Modena and Reggio Emilia); Guido Borghi (University of Modena and Reggio Emilia); Roberto Vezzani (University of Modena and Reggio Emilia, Italy); Rita Cucchiara (University of Modena and Reggio Emilia)
12. Active Two Phase Collaborative Representation Classifier for Image Categorization
   Fadi Dornaika (University of the Basque Country); Youssof El Traboulsi (University of Technology of Belfort Montbéliard); Yassine Ruichek (University of Technology of Belfort Montbéliard)

13. Blind Image Quality Assessment based on the use of Saliency Maps and a Multivariate Gaussian Distribution
   Christophe Charrier (University of Caen Normandy); Hakim Saadane (University of Nantes); Christine Fernandez-Maloigne (University of Poitiers)

14. A graph-based Color Lines model for image analysis
   David Arturo Duque-Arias (MINES ParisTech); Santiago Velasco-Forero (MINES ParisTech); Jean-Emmanuel Deschaud (MINES ParisTech); François Goulette (MINES ParisTech); Beatriz Marcotegui (MINES ParisTech)

15. Take a ramble into solution spaces for classification problems in neural networks
   Enzo Tartaglione (University of Turin); Marco Grangetto (University of Turin)

16. Evaluating Deep Convolutional Neural Networks as Texture Feature Extractors
   Leonardo S Scabini (Universidade de São Paulo); Rayner Condori (Universidade de São Paulo); Lucas C. Ribas (Universidade de São Paulo); Odemir Bruno (USP)

17. Unsupervised Domain Adaptation using Full-Feature Whitening and Colouring
   Subhankar Roy (University of Trento); Aliaksandr Siarohin
18. Frame Interpolation using Phase Information and Guided Image Filtering
Fahim Arif (National University of Sciences and Technology, Islamabad); Sundus Amin (NUST); Abdul Ghafoor (NUST); M Mohsin Riaz (COMSATS University)

19. Generalised Gradient Vector Flow for Content-aware Image Resizing
Tiziana Rotondo (University of Catania); Alessandro Ortis (University of Catania); Sebastiano Battiato (University of Catania)

20. Learning to Rank Food Images
Dario Allegra (University of Catania); Daniela Erba (University of Milan); Giovanni Maria Farinella (University of Catania); Giovanni Grazioso (University of Milan); Paolo Maci (University of Catania); Filippo Stanco (University of Catania); Valeria Tomaselli (STMicroelectronics)

21. Supervised Two-Stage-TL on Imbalanced Dataset for Sport Classification
Tianyu Bi (Tu/e); Dmitri Jarnikov (Eindhoven University of Technology); Johan Lukkien (Eindhoven University of Technology)

22. A Block-Based Union-Find Algorithm to Label Connected Components on GPUs
Stefano Allegretti (University of Modena and Reggio Emilia); Federico Bolelli (University of Modena and Reggio Emilia); Michele Cancilla (University of Modena and Reggio Emilia); Costantino Grana (University of Modena and Reggio Emilia)
23. A New Descriptor for Keypoint-Based Background Modeling
   Danilo Avola (Sapienza University of Rome); Marco Bernardi (Sapienza University of Rome); Marco Cascio (Sapienza University of Rome); Luigi Cinque (University La Sapienza of Rome); Gian Luca Foresti (University of Udine); Cristiano C Massaroni (Sapienza University of Rome)

24. Preliminary experiment of the interactive registration of a trocar for thoracoscopy with Hololens headset
   Christophe Lohou (Université Clermont Auvergne)

25. A low-cost computer vision system for real-time tennis analysis
   Stefano Messelodi (Fondazione Bruno Kessler (FBK)); Carla Maria Modena (Fondazione Bruno Kessler (FBK)); Valerio Ropele (Eyes VisiON srl); Stefano Marcon (Eyes VisiON srl); Mario Sgro (Eyes VisiON srl)

Thursday, September 12

09:00 - 10:00
Invited Talk 2 : Tal Ayellet

10:00 - 11:00
Oral Session 3 - Deep Learning

1. Tackling Partial Domain Adaptation with Self-Supervision
   Silvia Bucci (Istituto Italiano di Tecnologia (IIT)); Antonio D'Innocente (Sapienza University of Rome); Tatiana Tommasi (Politecnico di Torino)

2. Hebbian Learning Meets Deep Learning
   Giuseppe Amato (CNR-ISTI); Fabio Carrara (CNR-ISTI); Fabrizio
3. Regularized Evolutionary Algorithm for Dynamic Neural Topology Search
Cristiano Saltori (University of Trento); Subhankar Roy (University of Trento); Nicu Sebe (University of Trento); Giovanni Iacca (University of Trento)

Tomaso Fontanini (University of Parma); Eleonora Iotti (University of Parma); Andrea Prati (University of Parma)

11:00 - 11:30
Coffee Break

11:30 - 12:30
Oral Session 4 - Brave New Ideas

1. Ontology-Driven Food Category Classification in Images
Ivan Donadello (Fondazione Bruno Kessler (FBK)); Mauro Dragoni (Fondazione Bruno Kessler (FBK))

2. Image-to-Image Translation to Unfold the Reality of Artworks: an Empirical Analysis
Matteo Tomei (University of Modena and Reggio Emilia); Marcella Cornia (University of Modena and Reggio Emilia); Lorenzo Baraldi (University of Modena and Reggio Emilia); Rita Cucchiara (University of Modena and Reggio Emilia)

3. Image Memorability using Diverse Visual Features and Soft Attention
Marco Leonardi (University of Milano - Bicocca); Luigi Celona (University of Milano - Bicocca); Paolo Napoletano (University of Milano - Bicocca); Simone Bianco (University of Milano - Bicocca); Raimondo Schettini (University of Milano-Bicocca); Franco Manessi (Lastminute.com); Alessandro Rozza (Lastminute.com)

12:30 - 13:00
Spotlight Session 2

1. Problems with saliency maps
Giuseppe Boccignone (University of Milan); Vittorio Cuculo (University of Milan); Alessandro D'Amelio (University of Milan)

2. Prediction of Social Image Popularity Dynamics
Alessandro Ortis (University of Catania); Giovanni Maria Farinella (University of Catania); Sebastiano Battiato (University of Catania)

3. Improving the Performance of Thinning Algorithms with Directed Rooted Acyclic Graphs
Federico Bolelli (University of Modena and Reggio Emilia); Costantino Grana (University of Modena and Reggio Emilia)

4. 3DMM for Accurate Reconstruction of Depth Data
Claudio Ferrari (University of Florence); Stefano Berretti (University of Florence); Pietro Pala (University of Florence); Alberto Del Bimbo (University of Florence)

5. Mask Guided Fusion For Group Activity Recognition In Images
Arif Akar (Hacettepe University); Nazli Ikizler-Cinbis (Hacettepe University)
6. Recognition of Human Activities in Daubechies Complex Wavelet Domain
   Dr. Manish Khare (Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT))

7. ActiVis: Mobile Object Detection and Active Guidance for People with Visual Impairments
   Jacobus C Lock (University of Lincoln); Nicola Bellotto (University of Lincoln); Andrea Tramontano (University of Padova); Stefano Ghidoni (University of Padova)

8. Vehicle Trajectories from Unlabeled Data through Iterative Plane Registration
   Federico Becattini (University of Florence); Lorenzo Seidenari (University of Florence); Lorenzo Berlincioni (University of Florence); Leonardo Galteri (University of Florence); Alberto Del Bimbo (University of Florence)

   Mohbat Tharani (Lahore University of Management Sciences (LUMS)); Tooba Mukhtar (Lahore University of Management Sciences); Numan Khurshid (LUMS); Murtaza Taj (LUMS)

13:00 - 14:30
   Lunch

14:30 - 16:30
   Poster Session 3

1. Problems with saliency maps
   Giuseppe Boccignone (University of Milan); Vittorio Cuculo
2. Prediction of Social Image Popularity Dynamics  
Alessandro Ortis (University of Catania); Giovanni Maria Farinella (University of Catania); Sebastiano Battiato (University of Catania)

3. Improving the Performance of Thinning Algorithms with Directed Rooted Acyclic Graphs  
Federico Bolelli (University of Modena and Reggio Emilia); Costantino Grana (University of Modena and Reggio Emilia)

4. 3DMM for Accurate Reconstruction of Depth Data  
Claudio Ferrari (University of Florence); Stefano Berrettì (University of Florence); Pietro Pala (University of Florence); Alberto Del Bimbo (University of Florence)

5. Mask Guided Fusion For Group Activity Recognition In Images  
Arif Akar (Hacettepe University); Nazli Ikizler-Cinbis (Hacettepe University)

6. Recognition of Human Activities in Daubechies Complex Wavelet Domain  
Dr. Manish Khare (Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT))

7. ActiVis: Mobile Object Detection and Active Guidance for People with Visual Impairments  
Jacobus C Lock (University of Lincoln); Nicola Bellotto (University of Lincoln); Andrea Tramontano (University of Padova); Stefano Ghidoni (University of Padova)

8. Vehicle Trajectories from Unlabeled Data through Iterative Plane Registration  
Federico Becattini (University of Florence); Lorenzo Seidenari
   Mohbat Tharani (Lahore University of Management Sciences (LUMS)); Tooba Mukhtar (Lahore University of Management Sciences); Numan Khurshid (LUMS); Murtaza Taj (LUMS)

10. **View-invariant Pose Analysis for Human Movement Assessment from RGB Data**
    Faegheh Sardari (University of Bristol); Adeline Paiement (University of Toulon); Majid Mirmehdi (University of Bristol)

11. **Hyperspectral Image Classification via Convolutional Neural Network based on Dilation Layers**
    Rami Reddy Devaram (University of Catania); Dario Allegra (University of Catania); Giovanni Gallo (University of Catania); Filippo Stanco (University of Catania)

12. **A Saliency-based Convolutional Neural Network for Table and Chart Detection in Digitized Documents**
    Isaak Kavasidis (University of Catania); Carmelo Pino (University of Catania); Francesco Rundo (University of Catania); Daniela Giordano (University of Catania); Paolo Messina (Tab2ex); Concetto Spampinato (University of Catania)

13. **Training Efficient Semantic Segmentation CNNs on Multiple Datasets**
    Marco Leonardi (University of Milano - Bicocca); Davide Mazzini (University of Milano-Bicocca); Raimondo Schettini (University of Milano-Bicocca)
14. Estimation of Speed and Distance of Surrounding Vehicles from a Single Camera
Mikko Zaffaroni (University of Turin, Istituto Superiore Mario Boella); Marco Grangetto (University of Turin); Alessandro Farasin (Politecnico di Torino)

15. Combining Saliency Estimation methods
Marco Buzzelli (University of Milano - Bicocca); Simone Bianco (University of Milano - Bicocca); Gianluigi Ciocca (University of Milano-Bicocca)

16. Analysis of Dynamic Brain Connectivity Through Geodesic Clustering
Muhammad Aabubakar Yamin (Istituto Italiano di Tecnologia (IIT)); Michael Dayan (Istituto Italiano di Tecnologia (IIT)); Letizia Squarcina (Scientific Institute IRCCS “E. Medea”); Paolo Brambilla (Department of Neurosciences and Mental Health, Fondazione IRCCS Ca’ Granda Ospedale Maggiore Policlinico, University of Milan); Vittorio Murino (Istituto Italiano di Tecnologia (IIT)); Vaibhav Diwadkar (Wayne State University); Diego Sona (Istituto Italiano di Tecnologia (IIT))

17. A decision tree for automatic diagnosis of Parkinson's disease from offline drawing samples: experiments and findings
Antonio Parziale (University of Salerno); Antonio Della Cioppa (University of Salerno); Rosa Senatore (University of Salerno); Angelo Marcelli (University of Salerno)

18. The Impact of Padding on Image Classification by Using pre-trained Convolutional Neural Networks
Hongxiang Tang (University of Catania); Alessandro Ortis (University of Catania); Sebastiano Battiato (University of Catania)
19. Automatic framework for multiple sclerosis follow-up by Magnetic Resonance Imaging for reducing contrast agents
Giuseppe Placidi (University of L'Aquila); Luigi Cinque (Sapienza University of Rome); Matteo Polsinelli (University of L'Aquila); Alessandra Splendiani (University of L'Aquila); Emanuele Tommasino (University of L'Aquila)

20. Emotional State Recognition with Micro-Expressions and Pulse Rate Variability
Reda Belaiche (University of Burgundy); Rita Meziati Sabour (ImViA); Cyrille Migniot (Universite de Bourgogne); Yannick Benezeth (LE2I); Dominique Ginhac (University of Burgundy); Keisuke Nakamura (Honda Research Institute); Randy Gomez (Honda Research Institute); Fan Yang (Laboratory Le2i CNRS 6306)

21. Visual and Textual Sentiment Analysis of daily news Social Media Images by Deep Learning
Andrea Felicetti (Università Politecnica delle Marche); Massimo Martini (Università Politecnica delle Marche); Marina Paolanti (Università Politecnica delle Marche); Roberto Pierdicca (Università Politecnica delle Marche); Emanuele Frontoni (Università Politecnica delle Marche); Primo Zingaretti (Università Politecnica delle Marche)

22. Deep Motion Model for Pedestrian Tracking in 360 degrees videos
Liliana Lo Presti (University of Palermo); Marco La Cascia (University of Palermo)

Sumedh D Pendurkar (College of Engineering, Pune); Biplab Banerjee (Indian Institute of Technology Bombay); Sudipan Saha
24. Genuine personality recognition from highly constrained face images
Fabio Anselmi (LCSL, Istituto Italiano di Tecnologia and Massachusetts Institute of Technology); Nicoletta Noceti (University of Genoa); Lorenzo Rosasco (University of Genoa); Robert Ward (Bangor University)

25. Automatic Segmentation based on Deep Learning Techniques for Diabetic Foot Monitoring through Multimodal Images
Abián Hernández (ULPGC); Natalia Arteaga-Marrero (IAC); Enrique Villa (IAC); Himar Fabelo (University of Las Palmas de Gran Canaria); Gustavo M. Callicó (University of Las Palmas de Gran Canaria); Juan Ruiz-Alzola (University of Las Palmas de Gran Canaria)

26. On Generative Modeling of Cell Shape Using 3D GANs
David Wiesner (Masaryk University); Tereza Nečasová (Masaryk University); David Svoboda (Masaryk University)

27. Particle Filtering for Tracking in 360 degrees Videos using virtual PTZ Cameras
Vito Monteleone (University of Palermo); Liliana Lo Presti (University of Palermo); Marco La Cascia (University of Palermo)

16:30 - 17:00
Coffee Break

17:00 - 19:00
CVPL Meeting
20:00 - 22:30
Conference Banquet

Friday, September 13

09:00 - 09:45
Invited Talk 3 : Emanuele Rodolà

09:45 - 10:30
Invited Talk 4 : Alessandra Sciutti

10:30 - 11:00
CVPL Highlights 1

1. Latent Space Autoregression for Novelty Detection
   Davide Abati (University of Modena and Reggio Emilia);
   Angelo Porrello (University of Modena and Reggio Emilia);
   Simone Calderara (University of Modena and Reggio Emilia);
   Rita Cucchiara (University of Modena and Reggio Emilia)

2. Model Vulnerability to Distributional Shifts over Image Transformation Sets
   Riccardo Volpi (IIT), Vittorio Murino (IIT)

3. Fitting Multiple Heterogeneous Models by Multi-class Cascaded T-linkage
   Luca Magri (University of Udine); Andrea Fusiello (University of Udine)

4. Domain Generalization by Solving Jigsaw Puzzles
   Fabio. M. Carlucci (Huawei); Antonio D’Innocente (Sapienza
University of Rome); Silvia Bucci (IIT); Barbara Caputo (Politecnico di Torino & IIT); Tatiana Tommasi (Politecnico di Torino)

5. Real-time self-adaptive deep stereo
Alessio Tonioni (University of Bologna); Fabio Tosi (University of Bologna); Matteo Poggi (University of Bologna); Stefano Mattoccia (University of Bologna); Luigi di Stefano (University of Bologna)

6. Unsupervised Domain Adaptation for ToF Data Denoising With Adversarial Learning
Gianluca Agresti (University of Padova); Henrik Schaefer (Sony Europe B.V.); Piergiorgio Sartor (Sony Europe B.V.); Pietro Zanuttigh (University of Padova)

7. AdaGraph: Unifying Predictive and Continuous Domain Adaptation through Graphs
Massimiliano Mancini (Sapienza University of Rome); Samuel Rota Bulò (Mapillary research); Barbara Caputo (Politecnico di Torino & IIT); Elisa Ricci (University of Trento & FBK)

11:00 - 11:30
Coffee Break

11:30 - 12:00
CVPL Highlights 2

1. Quasi-Unsupervised Color Constancy
Simone Bianco (University of Milano-Bicocca); Claudio Cusano
2. View-LSTM: Novel-view video synthesis through view decomposition
Mohamed Ilyes Lakhal (Queen Mary University of London & FBK), Oswald Lanz (Fondazione Bruno Kessler (FBK)), Andrea Cavallaro (Queen Mary University of London)

3. Art2Real: Unfolding the Reality of Artworks via Semantically-Aware Image-to-Image Translation
Matteo Tomei (University of Modena and Reggio Emilia); Marcella Cornia (University of Modena and Reggio Emilia); Lorenzo Baraldi (University of Modena and Reggio Emilia); Rita Cucchiara (University of Modena and Reggio Emilia)

4. Animating Arbitrary Objects via Deep Motion Transfer
Aliaksandr Siarohin (University of Trento); Stéphane Lathuilière (University of Trento); Sergey Tulyakov (Snap Inc.); Elisa Ricci (University of Trento & FBK); Nicu Sebe (University of Trento)

5. Query-guided End-to-End Person Search
Bharti Munjal (OSRAM GmbH, Technische Universität München); Sikandar Amin (OSRAM GmbH), Federico Tombari (Technische Universität München & Google AI); Fabio Galasso (OSRAM GmbH)

6. LSTA: Long Short-Term Attention for Egocentric Action Recognition
Swathikiran Sudhakaran (Fondazione Bruno Kessler (FBK)); Sergio Escalera (University of Barcelona & Computer Vision Center (CVC)); Oswald Lanz (Fondazione Bruno Kessler (FBK))

7. What Would You Expect? Anticipating Egocentric Actions with Rolling-Unrolling LSTMs and Modality Attention
12:00 - 13:00
Oral Session 5 - Applications

1. Performance Evaluation of Learned 3D Features
   Riccardo Spezialetti (University of Bologna); Samuele Salti (University of Bologna); Luigi Di Stefano (University of Bologna)

2. A Convolutional Neural Network for Virtual Screening of Molecular Fingerprints
   Isabella Mendolia (University of Palermo); Salvatore Contino (University of Palermo); Ugo Perricone (Fondazione Ri.MED); Roberto Pirrone (University of Palermo); Edoardo Ardizzone (University of Palermo)

3. Detecting sounds of interest in roads with deep networks
   Pasquale Foggia (University of Salerno); Alessia Saggese (University of Salerno); Nicola Strisciuglio (University of Groningen); Mario Vento (University of Salerno); Vincenzo Vigilante (University of Salerno)

4. On the Detection of GAN-based Face Morphs using Established Morph Detectors
   Luca Debiasi (University of Salzburg); Naser Damer (Fraunhofer IGD); Alexandra Moseguí Auladié (Fraunhofer Institute for Computer Graphics Research IGD); Christian Rathgeb (Hochschule Darmstadt); Ulrich Scherhag (Hochschule Darmstadt); Christoph Busch (Hochschule Darmstadt); Florian Kirchbuchner (Fraunhofer Institute for Computer Graphics Research IGD); Andreas Uhl (University of Salzburg)
13:00 - 14:30
Lunch

14:30 - 16:30
Poster Session 4

1. Hand Gestures for the Human-Car Interaction: the Briareo dataset
   Fabio Manganaro (University of Modena and Reggio Emilia); Stefano Pini (University of Modena and Reggio Emilia); Guido Borghi (University of Modena and Reggio Emilia); Roberto Vezzani (University of Modena and Reggio Emilia, Italy); Rita Cucchiara (University of Modena and Reggio Emilia)

2. Evaluation of continuous image features learned by ODE Nets
   Fabio Carrara (CNR-ISTI); Giuseppe Amato (CNR-ISTI); Fabrizio Falchi (CNR-ISTI); Claudio Gennaro (CNR-ISTI)

3. The effects of data sources: a baseline evaluation of the MoCA dataset
   Elena Nicora (University of Genoa); Gaurvi Goyal (University of Genoa); Nicoletta Noceti (University of Genoa); Francesca Odone (University of Genoa)

   Muhammad Shahid (Istituto Italiano di Tecnologia); Cigdem Beyan (Istituto Italiano di Tecnologia); Vittorio Murino (Istituto Italiano di Tecnologia)

5. An UAV autonomous warehouse inventorying by deep learning
   Antonio De Falco (University of Naples Parthenope); Fabio Narducci (University of Naples Parthenope); Alfredo Petrosino
6. Weakly Supervised Semantic Segmentation Using Constrained Dominant Sets
Sinem Aslan (Ca' Foscari University of Venice); Marcello Pelillo (Ca' Foscari University of Venice)

7. 1-D DCT Domain Analysis for JPEG Double Compression Detection
Oliver Giudice (University of Catania); Francesco Guarnera (University of Catania); Antonino Paratore (iCTLab srl); Sebastiano Battiato (University of Catania)

8. Contrastive explanations to classification systems using sparse dictionaries
Andrea Apicella (Federico II University); Francesco Isgro (University of Naples Federico II); Roberto Prevete (University of Naples Federico II); Gugliemo Tamburruni (University of Naples Federico II)

9. Segmentation of Pigment Signs in Fundus Images for Retinitis Pigmentosa Analysis by using Deep Learning
Daniel Riccio (University of Naples, Federico II); Maria Frucci (Institute for High Performance Computing and Networking (ICAR-CNR)); Nadia Brancati (Institute for High Performance Computing and Networking (ICAR-CNR)); Luigi Di Perna (Eye clinic, Multidisciplinary Department of Medical, Surgical and Dental Sciences, University of Campania “Luigi Vanvitelli”); Francesca Simonelli (Eye clinic, Multidisciplinary Department of Medical, Surgical and Dental Sciences, University of Campania “Luigi Vanvitelli”)

10. Feature-Based SLAM Algorithm for Small-Scale UAVs with Nadir View
Danilo Avola (Sapienza University of Rome); Luigi Cinque (Sapienza University of Rome); Alessio Fagioli (Sapienza University of Rome); Gian Luca Foresti (University of Udine); Cristiano C. Massaroni (Sapienza University of Rome); Daniele Pannone (Sapienza University of Rome)

11. Dynamic Texture Classification Using Deterministic Partially Self-avoiding Walks on Networks
Lucas C. Ribas (Universidade de São Paulo); Odemir Bruno (USP)

12. Vision Based Driver Smoking Behavior Detection Using Surveillance Camera Images
Yusuf Artan (HAVELSAN INC.); Burak Balci (HAVELSAN INC.); Bensu Alkan (HAVELSAN INC.); Alperen Elihos (HAVELSAN INC.)

13. Within-Network Ensemble for Face Attributes Classification
Sara Ahmed (Sabanci University); Berrin Yanikoglu (Sabanci University)

14. Memory Efficient Deployment of an OpticalFlow Algorithm on GPU using OpenMP
Olfa Haggui (Ecole des Mines Paris-Tech); claude tadonki (Ecole des mines Paris-Tech); fatma sayadi (Faculty of Sciences, Monastir); Bouraoui Ouni

15. Discovering Latent Domains for Unsupervised Domain Adaptation through Consistency
Massimiliano Mancini (Sapienza University of Rome); Lorenzo Porzi (Mapillary Research); Fabio Cermelli (IIT); Barbara Caputo (Politecnico di Torino)
16. Semantic Guided Deep Unsupervised Image Segmentation  
Sudipan Saha (Fondazione Bruno Kessler (FBK)); Swathikiran Sudhakaran (Fondazione Bruno Kessler (FBK)); Biplab Banerjee (Indian Institute of Technology Bombay); Sumedh D Pendurkar (College of Engineering, Pune)

17. Using Handwriting Features to Characterize Cognitive Impairment  
Nicole Dalia Cilia (University of Cassino and Southern Lazio); Claudio De Stefano (University of Cassino and Southern Lazio); Francesco Fontanella (University of Cassino and Southern Lazio); Mario Molinara (University of Cassino and Southern Lazio); Alessandra Scotto Di Freca (University of Cassino and Southern Lazio)

18. Gaze-based Human-Robot Interaction by the Brunswick Model  
Riccardo Berra (University of Verona); Francesco Setti (University of Verona); Marco Cristani (University of Verona)

19. Multiple Organs Segmentation in Abdomen CT Scans Using a Cascade of CNNs  
Muhammad Usman Akbar (Istituto Italiano di Tecnologia (IIT)); Shahab Aslani (Istituto Italiano di Tecnologia (IIT)); Vittorio Murino (Istituto Italiano di Tecnologia (IIT)); Diego Sona (Istituto Italiano di Tecnologia (IIT))

20. Virtual Crowds: an LSTM-based framework for crowd simulation  
Nicola Garau (University of Trento); Niccolò Bisagno (University of Trento); Nicola Conci (University of Trento); Andrea Montagner (University of Trento)

21. Worldly eyes on video: learnt vs. reactive deployment of attention to dynamic stimuli  
Raffaella Lanzarotti (University of Milan); Giuliano Grossi
22. Classification of skin lesions by combining multilevel learnings in a DenseNet architecture
Pierluigi Carcagni (National Research Council of Italy - Institute of Applied Sciences & Intelligent Systems); Marco Leo (National Research Council of Italy); Andrea Cuna (ISASI-CNR); Pier Luigi Mazzeo (CNR); Paolo Spagnolo (ISASI-CNR); Giuseppe Celeste (National Research Council of Italy); Cosimo Distante (National Research Council of Italy - Institute of Applied Sciences & Intelligent Systems)

23. Automatic creation of large scale object databases from Web resources: a case study in robot vision
Dario Molinari (Sapienza University of Rome); Giulia Pasquale (Italian Institute of Technology (IIT)); Lorenzo Natale (Italian Institute of Technology (IIT)); Barbara Caputo (Politecnico di Torino)
INVITED TALKS

1- Autonomous, Agile, Vision-controlled Drones: from Frame to Event Vision
Speaker: Davide Scaramuzza

When: Wednesday, September 11, 09:00 - 10:00
Where: Aula 1

Abstract: Autonomous quadrotors will soon play a major role in search-and-rescue and remote-inspection missions, where a fast response is crucial. Quadrotors have the potential to navigate quickly through unstructured environments, enter and exit buildings through narrow gaps, and fly through collapsed buildings. However, their speed and maneuverability are still far from those of birds. Indeed, agile navigation through unknown, indoor environments poses a number of challenges for robotics research in terms of perception, state estimation, planning, and control. In this talk, I will show that active vision is crucial in order to plan trajectories that improve the quality of perception. Also, I will talk about our recent results on event based vision to enable low latency sensory motor control and navigation in low light and high dynamic environment, where traditional vision sensor fail.

Bio: Davide Scaramuzza (born in 1980, Italian) is Professor of Robotics and Perception at both departments of Informatics (University of Zurich) and Neuroinformatics (ETH Zurich and University of Zurich), where he does research at the intersection of robotics and computer vision. He did his PhD in robotics and computer vision at ETH Zurich and a postdoc at the University of Pennsylvania. From 2009 to 2012, he led the European project sFly, which introduced the PX4 autopilot (used in half a million commercial drones today) and pioneered vision-based autonomous navigation of micro drones. For his research contributions, he was awarded the prestigious IEEE Robotics and Automation Early Career Award, the SNSF-ERC Starting Grant, a Google, Qualcomm, and INTEL awards, and several paper awards. He coauthored the book "Introduction to Autonomous Mobile Robots" (published by MIT Press; 10,000 copies sold) and more than 100 papers on robotics and perception.
He has served as a consultant for the United Nations (UN) International Atomic Energy Agency (IAEA) Fukushima Action Plan on Nuclear Safety, and several drone and computer-vision companies. In 2015, he cofounded Zurich-Eye, which later became Facebook-Oculus Zurich. Many aspects of his research have been prominently featured in the popular press, such as Discovery Channel, BBC, The New York Times, IEEE Spectrum, MIT Technology Review Magazine.

2- Past Forward: When Computer Vision and Archaeology Meet
Speaker: Ayellet Tal

When: Thursday, September 12, 09:00 - 10:00
Where: Aula 1

Abstract: Technology is the symbol of our age. Nevertheless, some fields have been left out of the revolution. One of these is archaeology, where many tasks are still performed manually - from the initial excavation, through documentation, to restoration. It turns out that some of these activities are classical computer vision tasks, such as puzzle solving, shape completion, matching and edge detection. The objects, however, are much harder to deal with than usual, since they are broken and eroded after laying underground for thousands of years. Therefore, being able to handle these objects benefits not only archaeology, but also computer vision. In this talk I will describe some of the algorithms we have developed to replace manual restoration.

Bio: Ayellet Tal is a professor in the Department of Electrical Engineering and heads the Computer Graphics and Multimedia Lab at the Technion, Israel. She holds a Ph.D. in Computer Science from Princeton University and a B.Sc degree (Summa cum Laude) in Mathematics and Computer Science from Tel-Aviv University. Her research interests span computer graphics, computer vision and information visualization. She regularly serves as an area chair and as a member of program committees of the major international conferences and as an associate editor of journals.
3- Hearing the shape of things
Speaker: Emanuele Rodolà

When:  Friday, September 13, 09:00 - 09:45
Where:  Aula 1

Abstract:  Spectral geometry is at the heart of a variety of problems in computer vision, graphics, pattern recognition and machine learning. Ultimately, the core reason for its success can be traced down to questions of stability and informativeness of the eigenvectors and eigenvalues of certain operators. In this talk, I will discuss and show tangible examples of such properties, and showcase some dramatic implications on a selection of notoriously hard problems in computer vision and graphics. First, I will address the question whether one can recover the shape of a geometric object from its vibration frequencies ('hear the shape of the drum'); while theoretically the answer to this question is negative, little is known about the practical possibility of using the spectrum for shape reconstruction and optimization. I will introduce a numerical procedure called isospectralization, showing how this *practical* problem is solvable. Then, I will discuss the widespread problem of data corruption and partiality, and demonstrate how knowledge of the behavior of the spectral decomposition of Laplacians can lead to unprecedented results as exemplified on partial dense correspondence of deformable 3D shapes. I will conclude my talk with an overview of current and future work in these areas, with a look at potential applications in computational biology, computer-assisted medical diagnosis, and deep learning.

Bio:  Emanuele Rodolà is a tenured professor of computer science at Sapienza University of Rome, where he leads the Geometric and Visual Computing group funded by an ERC Starting Grant (2018-). Previously, he held positions at USI Lugano, TU Munich, and the University of Tokyo under various fellowships. He holds or has held visiting positions at Tel Aviv University, Technion, Ecole polytechnique, Harvard, and Stanford. He received best paper awards at 3DPVT 2010, VMV 2015, and SGP 2016, has been serving since 2010 in the program committees of CVPR, ICCV, ECCV, etc., has
been serving as Area Chair at 3DV since 2016, founded and chaired several successful workshops including the IEEE workshop on Geometry Meets Deep Learning, organized multiple SHREC contests, and was recognized 8 times as IEEE Outstanding Reviewer. He gave tutorials and short courses in multiple occasions at ECCV, EUROGRAPHICS, SGP, SIGGRAPH, and SIGGRAPH Asia. His work on 3D reconstruction was featured by the national Italian television (RAI) in 2012. His research focuses on spectral geometry processing, 3D computer vision and geometric deep learning, and has published more than 60 papers in these areas.

4- Cognitive Vision for Human Robot Interaction
Speaker: Alessandra Sciutti

When: Friday, September 13, 09:45 - 10:30
Where: Aula 1

Abstract: Society is expecting robots to enter our houses and factories tomorrow, with the aim of cooperating with us. For this goal to be achievable, it is necessary that these agents become primarily cognitive systems, endowed with a cognitive architecture that enables them to adapt, predict, and pro-actively interact with the environment and the human partners. In this framework, vision needs to be cognitive: purposive, adaptive and anticipatory. Furthermore an artificial cognitive visual system which aims at existing and thriving in a human society needs the ability to communicate. Human communication is based on mutual understanding: I know how to communicate because I entertain a model of you, which enables me to select an effective way to convey to you what I want and to have an intuition of your internal states – what you need, fear or desire. Such intuition guides my vision, enabling me to perceive properties that would be otherwise not accessible to my perception, as goals, emotions or effort.

Our contribution to the roadmap toward cognitive vision systems leverages on the use of a humanoid robot (iCub) to try and test some of our assumptions on how to build a cognitive interactive agent. We attempt at modeling the minimal skills necessary for cognitive development, focusing on the visual features that enable to recognize the presence of other agents in the scene, to allow action matching across different visual perspectives and
to foster automatic speed adaptation in human-robot interactive repetitive tasks. We investigate how a robot could leverage on visual signals to anticipate the partner’s goals for collaborative or competitive purposes, to infer the right moment to interact and to assess the emotional reactions of the partners.

In a dual approach we are trying to understand how to modulate robot behavior to elicit better human understanding and to express different characteristics of the interaction: from the mood to the level of commitment. This approach is propaedeutic to the creation of a cognitive vision system, by helping in the definition of what is relevant to attend to, starting from signals originating from the intrinsic characteristics of the human body.

We believe that only a structured effort toward cognitive vision – or better visually-enabled cognition – will in the future allow for more humane machines, able to see the world and people as we do and engage with them in a meaningful manner.

Bio: Alessandra received her Ph.D. in Humanoid Technologies from the University of Genoa (Italy) in 2010. After a Post Doc at theIstituto Italiano di Tecnologia (IIT) and two research periods in USA and Japan, she became the scientific responsible of the Cognitive Robotics and Interaction Laboratory of the RBCS Dept. at IIT. After being Assistant Professor in Bioengineering at DIBRIS University of Genoa, she is now Tenure-Track Researcher at theIstituto Italiano di Tecnologia, head of the COgNiTive Architecture for Collaborative Technologies (CONTACT) unit. In 2018 she has been awarded the ERC Starting Grant wHiSPER, focused on the investigation of joint perception between humans and robots. She published more than 60 papers and abstracts and participated in the coordination of the CODEFROR European IRSES project. She is an Associate Editor of Robots and Autonomous Systems, Cognitive Systems Research and the International Journal of Humanoid Robotics and she has served as a member of the Program Committee for the International Conference on Human-Agent Interaction and IEEE International conference on Development and Learning and Epigenetic Robotics. The scientific aim of her research is to investigate the sensory and motor mechanisms underlying mutual understanding in human-human and human-robot interaction.
AREA CHAIRS

Video Analysis and Understanding
Andrea Cavallaro, Queen Mary University of London
Efstratios Gavves, University of Amsterdam

Pattern Recognition & Machine Learning
Battista Biggio, University of Cagliari
Marcello Pelillo, University of Venice

Deep Learning
Marco Gori, University of Siena
Francesco Orabona, Boston University

Multimedia
Xavier Alameda-Pineda, INRIA
Francesco De Natale, University of Trento

Multiview Geometry and 3D Computer Vision
Andrea Fusiello, University of Udine
Alessio Del Bue, Istituto Italiano di Tecnologia (IIT)
Federico Tombari, Technische Universität München

Image Analysis, Detection and Recognition
Barbara Caputo, Sapienza University of Rome
Jasper Uijlings, Google AI
Biomedical and Assistive Technology
Giovanni Maria Farinella, University of Catania
Roberto Manduchi, UCSC

Digital Forensics
Giulia Boato, University of Trento
Fernando Pérez-González, University of Vigo

Image processing for Cultural Heritage
Andreas Rauber, TU Wien
Lorenzo Seidenari, University of Florence

Brave New Ideas
Michele Merler, IBM T. J. Watson Research Center
Concetto Spampinato, University of Catania
ORGANIZING COMMITTEE

General Chairs
Oswald Lanz, Fondazione Bruno Kessler
Stefano Messelodi, Fondazione Bruno Kessler
Nicu Sebe, University of Trento

Program Chairs
Elisa Ricci, University of Trento & Fondazione Bruno Kessler
Samuel Rota-Bulò, Mapillary Research
Cees Snoek, University of Amsterdam

Workshop Chairs
Marco Cristani, University of Verona
Andrea Prati, University of Parma

Tutorial Chairs
Costantino Grana, University of Modena e Reggio Emilia
Lamberto Ballan, University of Padova

Special Session Chairs
Marco Bertini, University of Florence
Tatiana Tommasi, Istituto Italiano di Tecnologia

Industrial Session Chairs
Paul Chippendale, Fondazione Bruno Kessler
Fabio Galasso, OSRAM

Publicity/Web Chairs
Davide Boscaini, Fondazione Bruno Kessler
Massimiliano Mancini, Sapienza University of Rome & Fondazione Bruno Kessler & Italian Institute of Technology

Publication Chair
Michela Lecca, Fondazione Bruno Kessler

Local Chairs
Fabio Poiesi, Fondazione Bruno Kessler
Gloria Zen, University of Trento
Stéphane Lathuillère, University of Trento

Asia Liaison Chair
Ramanathan Subramanian, University of Glasgow, Singapore

USA Liaison Chair
Yan Yan, Texas State University, USA

STEERING COMMITTEE

Virginio Cantoni, University of Pavia
Luigi Pietro Cordella, University of Napoli Federico II
Rita Cucchiara, University of Modena and Reggio Emilia
Alberto Del Bimbo, University of Florence
Marco Ferretti, University of Pavia
Gian Luca Foresti, University of Udine
Fabio Roli, University of Cagliari
Gabriella Sanniti di Baja, ICAR-CNR

67