Program

CT: Contributed Talk, IKL: Invited Keynote Lecture.

Tuesday, June 6, 2023

8:00–9:00	**Registration**	
9:00–9:20	**Opening session**	
09:20–10:40	**Session 1 (4 papers) - Chair: Thierry Sentenac**	
09:20–09:40	CT	Three-Dimensional Temperature Distribution Mapping by Generative Adversarial Network in Low Light Environment Using Thermography **Shohei Oka, Yonghoon Ji, Hiromitsu Fujii and Hitoshi Kono**
09:40–10:00	CT	Unveiling the Secrets of Paintings: Deep Neural Networks Trained on High-Resolution Multispectral Images for Accurate Attribution and Authentication **Michael Sander, Tom Sander and Maxime Sylvestre**
10:00–10:20	CT	Laser flying-spot thermography: an open-access dataset for machine learning and deep learning **Kevin Helvig, Pauline Trouvé-Peloux, Ludovic Gavérina, Jean-Michel Roche, Baptiste Abeloos and Christophe Pradère**
10:20–10:40	CT	Registration of thermal 3D models over time using low cost and portable devices **Evelyn Gutierrez, Benjamín Castañeda and Sylvie Treuillet**
10:40–11:00	**Coffee break - Exhibitors - Posters**	
11:00–12:40	**Session 2 (5 papers) - Chair: Hideo Saito**	
11:00–11:20	CT	Combining unsupervised and supervised deep learning approaches for surface anomaly detection **Domen Rački, Dejan Tomaževič and Danijel Skočaj**
11:20–11:40	CT	f-AnoGAN for non-destructive testing in industrial anomaly detection **Oumaima Sliti, Maxime Devanne, Sophie Kohler, Naim Samet, Jonathan Weber and Christophe Cudel**
11:40–12:00	CT	Frequency Perturbation Analysis for Anomaly Detection using Fourier Heat Map **Yoshikazu Hayashi, Hiroaki Aizawa, Shunsuke Nakatsuka and Kunihito Kato**
12:00–12:20	CT	Deep learning based industrial quality control on low-cost smart cameras **Stefano Toigo, Angelo Cenedese, Daniele Fornasier and Brendon Kasi**
12:20–12:40	CT	Reducing the latency and size of a deep CNN model for surface defect detection in manufacturing **Nikola Pižurica, Kosta Pavlović, Slavko Kovačević and Igor Jovančević**
12:40–14:00	**Lunch**	

12:40–14:00	**Lunch**	
14:00-15:00	**Invited Keynote Lecture - Chair: Igor Jovančević**	
14:00–15:00	IKL	Multi-spectral imaging for inspection and quality control of coatings **Steve Vanlanduit**
15:00–16:20	**Session 3 (4 papers) - Chair: Hajime Nagahara**	
15:00–15:20	CT	Co-design of an active depth from defocus camera for surface inspection **Benjamin Buat, Pauline Trouvé-Peloux, Frédéric Champagnat and Thierry Simon**
15:20–15:40	CT	Enhanced key-point detection for plenoptic imaging **Mohamad Al Assaad, Stéphane Bazeille, Thomas Josso-Laurain, Alain Dieterlen and Christophe Cudel**
15:40–16:00	CT	A Shape-from-silhouette Method for 3D-reconstruction of a Convex Polyhedron **Baptiste Brument, Lilian Calvet, Robin Bruneau, Jean Mélou, Simone Gasparini, Yvain Quéau, Francois Lauze and Jean-Denis Durou**
16:00–16:20	CT	Free surface measurement of a fluid in contact with a rotating cylinder **Nicolas Prouteau, Lionel Thomas, Sébastien Jarny and Laurent David**
16:20–16:40	**Coffee break - Exhibitors - Posters**	
16:40–17:40	**Session 4 (3 papers) - Chair: Christophe Cudel**	
16:40–17:00	CT	Underwater SLAM Based on Object Recognition Using YOLO in Acoustic Images **Hiroki Nakamura, Takahiro Nonoda and Yonghoon Ji**
17:00–17:20	CT	Construction of a grape quality index from RGB images of crates **Soizic Lefevre, Danielle Nuzillard and Alban Goupil**
17:20–17:40	CT	Automated fish detection and classification on sonar images using Detection Transformer and YOLOv7 **Ella Mahoro and Moulay A. Akhloufi**
18:00–18:30	**Bus transfer to Downtown**	
18:30–20:00	**Downtown visit**	

Wednesday, June 7, 2023

09:00–10:40	**Session 5 (5 papers) - Chair: Lew-Fock-Chong Lew-Yan-Voon**	
09:00–09:20	CT	Modal approach based on global stereocorrelation for defects measurement in Wire-Laser Additive Manufacturing **Khalil Hachem, Yann Quinsat, Christophe Tournier and Nicolas Beraud**
09:20–09:40	CT	3D shape estimation of wires from 3D x-ray CT images of electrical cables **Shiori Ueda, Kanon Sato, Hideo Saito and Yutaka Hoshina**
09:40–10:00	CT	Inspection of mechanical assemblies based on 3D Deep Learning segmentation **Assya Boughrara, Igor Jovančević, Jean-José Orteu and Mathieu Belloc**
10:00–10:20	CT	Visual inspection of complex mechanical assemblies based on Siamese networks for 3D point clouds **Velibor Dosljak, Igor Jovančević and Jean-José Orteu**
10:20–10:40	CT	Automated Aircraft Visual Inspection with Drone, by Airbus **Henri Marticou and Jérôme Fayolet**
10:40–11:00	**Coffee break - Exhibitors - Posters**	
11:00–12:40	**Session 6 (5 papers) - Chair: Yann Gavet**	
11:00–11:20	CT	Scene understanding pipeline for maintenance oriented tasks automation **Younes Zegaoui, Sébastien Dufour and Christophe Bortolaso**
11:20–11:40	CT	OLF: RGB-D Adaptive Late Fusion for Robust 6D Pose Estimation **Théo Petitjean, Zongwei Wu, Cédric Demonceaux and Olivier Laligant**
11:40–12:00	CT	Visuo-Tactile Pose Tracking Method for In-hand Robot Manipulation Tasks of Quotidian Objects **Camille Taglione, Carlos M. Mateo-Agulló and Christophe Stolz**
12:00–12:20	CT	Single-camera multi-point vision: on the use of robotics for digital image correlation **Matthieu Vitse, Xuyang Chang and Stéphane Roux**
12:20–12:40	CT	Edge Safety Detection for Forklift Tele-Operation in a 5G Private Network **Bruno Carvalho, Tristan Lieberherr, Romuald Mosqueron and Yves Chevallier**
12:40–14:00	**Lunch**	

12:40–14:00	**Lunch**	
14:00-15:00	**Invited Keynote Lecture - Chair: Pierre-Jean Lapray**	
14:00–15:00	IKL	Data-driven learning-based machine vision **Danijel Skočaj**
15:00–16:20	**Session 7 (4 papers) - Chair: Kazunori Umeda**	
15:00–15:20	CT	The evolution of the non-destructive defect detection in composites with the use of Terahertz radiation **Martyna Strag and Waldemar Swiderski**
15:20–15:40	CT	Concrete structure inspection based on deep learning approaches from visible and radar images **Philippe Foucher, Rémi Le, Amine Mansouri, Xavier Dérobert and Cyrille Fauchard**
15:40–16:00	CT	Operational modal analysis of a cantilever beam by phase-based sub-pixel motion estimated from experimental videos **Cédric Marinel, Olivier Losson, Benjamin Mathon, Jean Le Besnerais and Ludovic Macaire**
16:00–16:20	CT	Image processing through deep learning for the SHM of composite structures using piezoelectric elements **Salmanne Husain, Marc Rébillat and Fakhreddine Ababsa**
16:20–16:40	**Coffee break - Exhibitors - Posters**	
16:40–18:00	**Session 8 (4 papers) - Chair: Danielle Nuzillard**	
16:40–17:00	CT	Performance comparison of Division of Time and Division of Focal Plane polarimeters **Pierre-Jean Lapray and Laurent Bigué**
17:00–17:20	CT	Effect of lighting conditions on grape quality control by artificial vision **Pierre Beauseroy, Alexandre Baussard, Marie-Laure Panon and Marie Loyaux**
17:20–17:40	CT	Gloss assessment with deep photometric stereo: application to human skin **Clément Joubert, Benjamin Bringier, Julien Garnier, Majdi Khoudeir and Nicolas Amalric**
17:40–18:00	CT	Neural sphere detection in images for lighting calibration **Laurent Fainsin, Jean Mélou, Lilian Calvet, Axel Carlier and Jean-Denis Durou**
18:30–19:00	**Bus transfer to Conference Banquet**	
19:30–23:30	**Conference Banquet**	

Thursday, June 8, 2023

09:00–10:20	**Session 9 (4 papers) - Chair: Hisashi Aomori**	
09:00–09:20	CT	ACL: Active Curriculum Learning to Reducing Label Efforts **Yusei Yamada, Shiryu Ueno, Takumi Oshita, Shunsuke Nakatsuka and Kunihito Kato**
09:20–09:40	CT	Semi-automatic tools for nanoscale metrology and annotations for Deep Learning automation on Electron Microscopy images **Isaac Sanou, Julien Baderot, Yannick Benezeth, Stéphanie Bricq, Franck Marzani, Sergio Martinez and Johann Foucher**
09:40–10:00	CT	Consideration of An Extending Rare Data by Cluster Annotation **Hidehiro Ohki, Haruki Oka, Keiji Gyohten and Toshiya Takami**
10:00–10:20	CT	Handling Noisy Annotations in Deep Supervised Learning **Ichraq Lemghari, Sylvie Le Hégarat-Mascle, Emanuel Aldea and Jennifer Vandoni**
10:20–10:40	**Coffee break - Exhibitors - Posters**	
10:40–12:00	**Session 10 (4 papers) - Chair: Sylvie Treuillet**	
10:40–11:00	CT	Person Segmentation and Identification across Multiple wearable Cameras **Noriko Takemura, Haruya Sakashita, Shizuka Shirai, Mehrasa Alizadeh and Hajime Nagahara**
11:00–11:20	CT	Automatic Scoring in Fencing by using Skeleton Points Extracted from Images **Takehiro Sawahata, Alessandro Moro, Sarthak Pathak and Kazunori Umeda**
11:20–11:40	CT	Object detection model-based quality inspection using a deep CNN **Mohamed Chetoui and Moulay A. Akhloufi**
11:40–12:00	CT	XRANet: An eXtra-wide, Residual and Attention-based deep convolutional neural network for semantic segmentation **Roger Booto Tokime and Moulay A. Akhloufi**
12:00–12:40	**Closing session - Best Paper Awards**	
12:40–14:00	**Lunch**	

Friday, June 9, 2023 (optional)

07:30–9:00	**Bus transfer to Toulouse**
09:00–13:00	**Optional visits in Toulouse: Aeroscopia Museum + Airbus Final Assembly Line**

Poster presentations

Part-Level Single-View 3D Shape Reconstruction with Multiple Types of Primitives
Mami Kikuchi, Seiya Ito, Naoshi Kaneko and Kazuhiko Sumi

Hierarchical Lossless Image Coding using CNN Predictors Considering Prediction Error Distribution
Kazuki Nakashima, Ryo Nakazawa, Hideharu Toda, Hisashi Aomori, Tsuyoshi Otake, Ichiro Matsuda and Susumu Itoh

Sparse image measurement using deep compressed sensing to accelerate image acquisition in 3D XRM
Tan Ying Hao, Nicholas Vun and Bu-Sung Lee

Estimation of subtle facial emotion changes from expressionless images
Arvin Valderrama, Takumi Taketomi, Chandra Louis, Tamami Sanbongi, Akihiro Kuno, Satoru Takahashi and Takeshi Nagata

Visual impression estimation system considering attribute information
Yukiya Taki, Kunihito Kato, Kazunori Terada and Kensuke Tobitani

We can pass through the wall gap?: Aperture passage perception via vibration stimuli generated from distance variation
Shinichiro Morita, Yuki Kikuchi, Akira Saeki, Itta Endo, Harumi Kobayashi, Naoki Mukawa, and Akio Nakamura

OCR for laser marking quality assessment
Jeanne Beyazian and John Sadi

Detection and characterization of defects on mechanical structures by using 3D vision
Hamdi Ben Abdallah, Zakaria Belbacha, Igor Jovančević, Jean-José Orteu and Ludovic Brèthes

Invited Keynote Speakers

Tuesday, June 6, 2023

Multi-spectral imaging for inspection and quality control of coatings

Steve Vanlanduit, University of Antwerp, Belgian

Steve Vanlanduit graduated as a mathematician from the university of Antwerp in 1997. After his studies, he obtained a PhD in system identification for mechanical systems in the Department of Electrical Engineering (ELEC) of the university of Brussels. In 2003 he became a professor in the Department of Mechanical Engineering (MECH) of the VUB, where he mainly performed research on optical measurement techniques in vibration engineering. In 2014 he moved to the University of Antwerp, where he is now vice-dean of research in the Faculty of Applied Engineering and chairman of the Industrial Vision Lab (InViLab) research group.

Coatings and other surface treatments are commonly used to protect materials from environmental exposure. This is the case for offshore structures, aircraft, vehicles but also petrochemical equipment (which are all subject to corrosion). To guarantee a long service life of quality control must be performed when applying the coating, and non-destructive inspection should be performed regularly during the operation of the structure. In this presentation, we will demonstrate that multi-spectral imaging techniques can be used for quality control and non-destructive inspection of coatings. In the first part of the presentation, we will give an overview of the different existing multi-spectral camera technologies and we will discuss their strengths and limitations. The second part of the talk deals with different machine learning methods for multi-spectral imaging. In the last part of the presentation, we will give an overview of different industrial cases studies: e.g. quality control during (laser ablation) cleaning of material surfaces, detection of coating defects like drops and non-uniformities in coating thickness after the application of the coating and inspection of coating deterioration after UV exposure and accelerated corrosion testing.

Wednesday, June 7, 2023

Data-driven learning-based machine vision

Danijel Skočaj, University of Ljubljana, Slovenia

Danijel Skočaj is a full professor at the University of Ljubljana, Faculty of Computer and Information Science. He is the head of the Visual Cognitive Systems Laboratory. His main research interests lie in the fields of computer vision, pattern recognition, deep learning, and cognitive robotics. He has led or collaborated in a number of projects from these research areas, such as EU projects, national research projects as well as industry-funded applied projects. Through research and development projects he facilitates the transfer of research findings into practical applications. He is also interested in the ethical aspects of artificial intelligence, machine learning and robotics, and the influence of the development of these technologies on society. He served as the president of the IEEE Slovenia Computer Society, and as the president of the Slovenian Pattern Recognition Society.

In the last decade, computer vision has made tremendous progress, driven by rejuvenated deep learning and fuelled by large quantities of data that have become readily available. In the last couple of years, the data-driven learning-based approach has also started entering a more conservative engineering discipline of machine vision. It has proven to be a very promising alternative to the main development paradigm, which is based on developing hand-engineered specific solutions for machine vision problems. The learning-based approach facilitates more general, efficient, flexible and economical development, deployment and maintenance of machine vision systems. In this talk, we will discuss this new development paradigm. Several data-driven approaches to surface defect detection will be presented, ranging from unsupervised to fully supervised methods. We will discuss the advantages of these approaches and the challenges they face and address the role and opportunities of learning-based approaches for efficient visual inspection as well as for solving other tasks that rely on the processing of visual information in the framework of the Industry 4.0 paradigm.