Technical program of the

2023 IEEE 33RD INTERNATIONAL WORKSHOP ON MACHINE LEARNING FOR SIGNAL PROCESSING (MLSP)

September 17-20, 2023 – Rome, Italy

PROGRAM-AT-A-GLANCE

		MLSP 2023 Program-at-a-Glance			
		September 17th	September 18th	September 19th	September 20th
Morning	8:00 - 8:30			Registration	
	8:30 - 9:00		Registration	Lecture 3 Special Session "Multiview Representation Learning For Machine Learning And Data Fusion"	
	9:00 - 9:30		Opening		Registration
	9:30 - 10:00	Registration	Lecture 1 "Recent Trends in MLSP"		Lecture 6 "Industry Session"
	10:00 - 10:30	Tutorial 1 "Bi-Level Optimization In Signal Processing And Machine Learning: Foundations And Emerging Applications"			
	10:30 - 11:00			Lecture 4 Special Session "Efficient Bayesian Methods For Signal Processing"	
	11:00 - 11:30				
	11:30 - 12:00		Coffee break		
	12:00 - 12:30		Keynote 2 Speaker: Klaus-Robert Müller	Keynote 3 Speaker: Mihaela Van Der Schaar	Keynote 4 Speaker: Stefanos Zafeiriou
	12:30 - 13:00				
Lunch	13:00 - 14:30		Lunch		
Afternoon	14:30 - 15:00	Tutorial 2 "Spatial Audio Signal Processing – Overview And Machine Learning Challenges"	Lecture 2 "Celebrating Jan Larsen's Life and Contributions"	Lecture 5 Thematic Session on "Explainable and Reliable Machine Learning in Signal & Data Science"	Lecture 7 "Deep Generative Models"
	15:00 - 15:30				
	15:30 - 16:00				
	16:00 - 16:30	Coffee break			Awards and Closing
	16:30 - 17:00	Tutorial 3 "Model-Based Deep Learning"	Poster 1 "Deep Learning techniques"	Poster 2 "MLSP Applications 1"	Poster 3 "MLSP Applications 2"
	17:00 - 17:30				
	17:30 - 18:00				
	18:00 - 18:30	Keynote 1 Speaker: José C. Principe			
	18:30 - 19:00		Tour and happy hour	Guided walking tour in the amazing Monti	
Evening	19:00 - 19:30	Welcome Cocktail Reception			Tour and pizza
	19:30 - 20:00				
	20:00 - 20:30				
	20:30 - 21:00			Social Dinner (The Hive Hotel)	
	21:00 - 23:00				

VENUES

September 17, 2023: San Pietro in Vincoli – Via Eudossiana 18, Rome

The first day of the 2023 MLSP workshop will take place in this beautiful building of La Sapienza University (the venue is near the Colosseo stop of the B-line subway).

September 18–20, 2023: Roma Eventi Fontana di Trevi – Piazza della Pilotta 4, Rome

The 2023 MLSP workshop will be held inside a beautiful complex of the Conference Centre "Roma Eventi Fontana di Trevi", located in the heart of Rome, within walking distance from the Quirinale and the Trevi Fountain. From Termini station take the number 40 Express Bus or the A-line subway for 2 stops and get off at BARBERINI (continue on foot for approximately 800 m).

PROGRAM

SUNDAY SEPTEMBER 17, 2023 (10:00 – 21:00)

09:30 – 19:00		Registration
10:00 – 13:00	Cloister Hall	Tutorial 1 - "Bi-Level Optimization in Signal Processing and Machine Learning: Foundations and Emerging Applications"
13:00 – 14:30		Lunch
14:30 – 16:00	Cloister Hall	Tutorial 2 - "Spatial Audio Signal Processing – Overview and Machine Learning Challenges"
16:00 – 16:30		Coffee Break
16:30 – 18:00	Cloister Hall	Tutorial 3 - "Model-Based Deep Learning"
18:00 – 19:00	Cloister Hall	Keynote 1 – "Multivariate Measures of Statistical Dependence", Speaker: José C. Principe
19:00 – 21:00	Cloister	Welcome Reception

Tutorial 1 – "Bi-Level Optimization in Signal Processing and Machine Learning: Foundations and Emerging Applications"

Room: Cloister Hall (10:00 – 13:00)

Speakers: Yihua Zhang (*Michigan State University, MI, USA*), Prashant Khanduri (*Wayne State University, MI, USA*), Ioannis Tsaknakis (*University of Minnesota, MN, USA*), Mingyi Hong (*University of Minnesota, MN, USA*), Sijia Liu

Lunch break (13:00 – 14:30)

Tutorial 2 – "Spatial Audio Signal Processing – Overview and Machine Learning Challenges"

Room: Cloister Hall (14:30 – 16:00)

Speakers: Boaz Rafaely, Hanan Beit-On, Or Berbi (*Ben-Gurion University of the Negev, Israel*)

Coffee break (16:00 – 16:30)

Tutorial 3 – "Model-Based Deep Learning"

Room: Cloister Hall (16:30 – 18:00)

Speakers: Nir Shlezinger (*Ben-Gurion University of the Negev, Israel*)

Keynote 1 – "Multivariate Measures of Statistical Dependence"

Room: Cloister Hall (18:00 – 19:00)

Speaker: José C. Principe (*University of Florida, FL, USA*)

Chair: Aurelio Uncini, *Sapienza University of Rome*

Welcome Reception

Location: Cloister (19:00 – 21:00)

Monday September 18, 2023 (9:00 –18:30)

08:30 – 18:30		Registration
09:00 – 09:30	Loyola Auditorium	Opening Greeting
09:30 – 11:30	Loyola Auditorium	Lecture 1 - "Recent Trends in MLSP"
11:30 – 12:00		Coffee Break
12:00 – 13:00	Loyola Auditorium	Keynote 2 - "Machine learning for the sciences – Toward understanding", Speaker: Klaus-Robert Müller
13:00 – 14:30		Lunch
14:30 – 16:30	Loyola Auditorium	Lecture 2 - "Celebrating Jan Larsen's Life and Contributions"
16:30 – 18:30	Foscolo Hall	Poster Session 1 - "Deep Learning techniques" + Coffee Break
18:30 – 21:00		Tour and happy hour

Opening Greeting

Room: Loyola Auditorium (09:00 – 09:30)
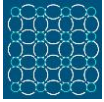
Lecture 1 – "Recent Trends in MLSP"

Room: Loyola Auditorium (09:30 – 11:30)

Chairs: Jen-Tzung Chien, *National Yang Ming Chiao Tung University*

　　　Simone Scardapane, *Sapienza University of Rome*

09:30 – 09:47　**Lightweight image inpainting by stripe window transformer with joint attention to CNN**
Bo-Wei Chen (National Chung Hsing University); Tsung-Jung Liu (National Chung Hsing University); Kuan-Hsien Liu (National Taichung University of Science and Technology)

09:47 – 10:04　**Learning outlier-aware representation with synthetic boundary samples**
Jen-Tzung Chien (National Yang Ming Chiao Tung University); Kuan Chen (National Yang Ming Chiao Tung University)

10:04 – 10:21　**Distributionally robust domain adaptation**
Akram Awad (University of Central Florida); George Atia (University of Central Florida)

10:21 – 10:38	**Spatiotemporal predictive models for irregularly sampled time series**
	Quang Nguyen Tri Le (University of Ottawa); Francois Chan (University of Ottawa); Claude D'Amours (University of Ottawa)

10:38 – 10:55	**Inference and denoise: Causal inference-based neural speech enhancement**
	Tsun-An Hsieh (Academia Sinica, Taiwan); Chao-Han Huck Yang (Amazon); Pin-Yu Chen (IBM Research); Sabato M. Siniscalchi (Norwegian University of Science and Technology); Yu Tsao (Academia Sinica, Taiwan)

10:55 – 11:12	**A multitask learning approach for sound source tracking with icosahedral convolutional neural networks**
	Eduardo A. da Silva (Federal University of Rio de Janeiro); Luiz W. P. Biscainho (Federal University of Rio de Janeiro)

11:12 – 11:29	**Dual quaternion rotational and translational equivariance in 3D rigid motion modelling**
	Guilherme Neto Vieira (Unicamp); Marcos Eduardo Valle (Universidade Estadual de Campinas); Eleonora Grassucci (Sapienza University of Rome); Danilo Comminiello (Sapienza University of Rome)

Coffee break (11:30 – 12:00)

Keynote 2 – "Machine learning for the sciences – Toward understanding"

Speaker: Klaus-Robert Müller (*Technische Universität Berlin*)

Room: Loyola Auditorium (12:00 – 13:00)

Chair: Tülay Adali, *University of Maryland Baltimore County*

Lunch break (13:00 – 14:30)

Lecture 2 – "Celebrating Jan Larsen's Life and Contributions"

Room: Loyola Auditorium (14:30 – 16:30)

Chair: Tülay Adali, *University of Maryland Baltimore County*

Tommy Sonne Alstrøm, *Technical University of Denmark*

14:30 – 15:00	**Jan Larsen and NNSP/MLSP**
	Tulay Adali (University of Maryland Baltimore County), Tommy Sonne Alstrøm (Technical University of Denmark)

15:00 – 15:10	**Larsen's Learning to Generalize**
	Lars Kai Hansen (Technical University of Denmark)

15:10 – 15:20	**Speech Brain Computer Interfaces: Can it Give a Voice to the Voiceless?** *Marc Van Hulle (Katholieke Universiteit Leuven)*
15:20 – 15:40	**Adversarial Learning and the Transcendent Challenge of Robust AI** *David Miller (The Pennsylvania State University)*
15:40 – 15:50	**On Jan's Research and Contributions to MLSP** *Jen-Tzung Chien (National Chiao Tung University)*
15:50 – 16:10	**A Journey on Deploying Bayesian Optimization in a Real-world Product** *Jens Brehm Bagger Nielsen (Head of AI Accelerator, WSAudiology)*
16:10 – 16:30	**Bridging Machine Learning Research with Innovation and Health – The Other Half of Jan Larsen's Career** *Niels Henrik Pontoppidan (Principal Scientist, Eriksholm Research Centre)*

Poster Session 1 – "Deep Learning techniques"

Room: Foscolo Hall (16:30 – 18:30)

Chair: Luis Antonio Azpicueta-Ruiz, *Universidad Carlos III de Madrid*

Deep Learning techniques	
1	**Layer Ensembles** *Illia Oleksiienko (Aarhus University); Alexandros Iosifidis (Aarhus University)*
2	**Vertex-based networks to accelerate path planning algorithms** *Yuanhang Zhang (Ohio University); Jundong Liu (Ohio University)*
3	**Deep learning techniques for time series forecasting: An application for exchange rates** *Henri Makika (University of Campinas); João Marcos Travassos Romano (University of Campinas); Rosangela Ballini (University of Campinas)*
4	**2D-radar imaging with deep convolutional neural networks** *Mumin Jin (MIT); Atulya Yellepeddi (Analog Devices Inc.); Gregory W. Wornell (MIT)*
5	**PHYDI: initializing parameterized hypercomplex neural networks as identity functions** *Matteo Mancanelli (Sapienza University of Rome); Eleonora Grassucci (Sapienza University of Rome); Aurelio Uncini (Sapienza University of Rome); Danilo Comminiello (Sapienza University of Rome)*
6	**The distributed fusion filtering problem of tessarine signals from multisensor observations affected with packet dropouts** *José Domingo Jiménez López (University of Jaén); Rosa María Fernández-Alcalá (University of Jaén); Jesús Navarro-Moreno (University of Jaén); Juan Carlos Ruiz-Molina (University of Jaén)*

7 **Constraints-aware trainable pruning with system optimization for the on-demand offloading edge-cloud collaborative system**
Yi-Cheng Lo (National Taiwan University); Cheng-Lin Hsieh (National Taiwan University); An-Yeu (Andy) Wu (National Taiwan University)

8 **Trainable policy for the on-demand offloading on edge-cloud collaborative system**
Cheng-Lin Hsieh (National Taiwan University); Yi-Cheng Lo (National Taiwan University); An-Yeu (Andy) Wu (National Taiwan University)

Feature extraction/selection/learning

9 **Memory replay for continual learning with spiking neural networks**
Michela Proietti (Sapienza University of Rome); Alessio Ragno (Sapienza University of Rome); Roberto Capobianco (Sapienza University of Rome & Sony AI)

10 **Entropic Wasserstein component analysis**
Antoine Collas (Inria); Titouan Vayer (ENS Lyon); Rémi Flamary (École Polytechnique); Arnaud Breloy (Université Paris Nanterre)

11 **Robust feature selection with weight cost minimax optimization**
Mohammad Amin Omidi (Shahed University); Babak Seyfe (Shahed University); Shahrokh Valaee (University of Toronto)

Adversarial machine learning

12 **A BIC-based mixture model defense against data poisoning attacks on classifiers**
Xi Li (The Pennsylvania State University); David J. Miller (The Pennsylvania State University); Zhen Xiang (The Pennsylvania State University); George Kesidis (Penn State University)

13 **A robustness measure for neural networks**
Bahadir Bilgin (Tennessee State University); Ali Sekmen (Tennessee State University)

14 **On the interpretable adversarial sensitivity of iterative optimizers**
Elad Sofer (Ben-Gurion University); Nir Shlezinger (Ben-Gurion University)

15 **A discriminative approach to unsupervised domain adaptation in coarse-to-fine classifiers**
Ismail Alkhouri (Michigan State University); Akram Awad (University of Central Florida); Connor Hatfield (University of Central Florida); George Atia (University of Central Florida)

Sparsity-aware learning

16 **Deep unrolling for nonconvex robust principal component analysis**
Elizabeth Tan (National University of Singapore); Caroline Chaux (CNRS); Emmanuel Soubies (CNRS); Vincent Tan (National University of Singapore)

17 **Desketching of r-separable matrices from compressive linear measurements**
Neha Singh (Indian Institute of Technology Roorkee); Saurabh Khanna (Indian Institute of Technology Roorkee)

18 **Uncertainty quantification for learned ISTA**
Frederik Hoppe (RWTH Aachen University); Claudio Mayrink Verdun (Technical University of Munich); Felix Krahmer (Technical University of Munich); Hannah Laus (RWTH Aachen University); Holger Rauhut (RWTH Aachen University)

Pattern recognition and classification

19   Noise-tolerant self-embedded LSTM for seismic event classification

João Paulo Canário (UFBA); Ricardo Rios (Federal University of Bahia)

20   Classification with dictionary learning and a distance barrier promoting incoherence

Denis C. Ilie-Ablachim (University Politehnica of Bucharest); Bogdan Dumitrescu (University Politehnica of Bucharest)

Self-supervised and semi-supervised learning

21   Utilizing perturbation of atoms' positions for equivariant pre-training in 3D molecular analysis

Tal Kiani (Bar-Ilan University); Avi Caciularu (Bar-Ilan University); Shani Zev (Bar-Ilan University); Dan Thomas Major (Bar-Ilan University); Jacob Goldberger (Bar-Ilan University)

22   Semi-supervised learning-based approach for DoA estimation under hardware impairments

Hyunwoo Park (Hanynag University); Hyeonjin Chung (Hanynag University); Sunwoo Kim (Hanyang University)

23   Stream-based active learning with adaptive uncertainty and diversity thresholds

Prajit T. Rajendran (CEA LIST); Huascar Espinoza (KDTJU); Agnes Delaborde (LNE); Chokri Mraidha (Université Paris-Saclay, CEA List)

24   Federated representation learning through clustering

Runxuan Miao (University of Illinois at Chicago); Erdem Koyuncu (University of Illinois at Chicago)

Information-theoretic learning

25   The kernel maximal correlation filter

Yao Sun (University of Florida); Bo Hu (University of Florida); Jose C. Principe (University of Florida)

26   Information channels of deep neural networks

Manas Deb (Santa Clara University); Tokunbo Ogunfunmi (Santa Clara University)

27   Generalised active learning with annotation quality selection

Jakob Lindqvist (Chalmers University of Technology); Amanda Olmin (Linköping University); Lennart Svensson (Chalmers University of Technology); Fredrik Lindsten (Linköping University)

Learning theory and algorithms

28   Calibration-aware Bayesian learning

Jiayi Huang (King's college london); Sangwoo Park (King's College London); Osvaldo Simeone (King's College London)

29   A new non-convex framework to improve asymptotical knowledge on generic stochastic gradient descent

Jean-Baptiste Fest (Inria); Audrey Repetti (Heriot Watt University); Emilie Chouzenoux (Inria)
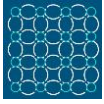
30 **Predicting generalization in deep learning using data augmentation and posterior probability estimators**

Parisa Ghane (Texas A&M University), Ulisses M. Braga-Neto (Texas A&M University)

Reinforcement learning

31 **Deep reinforcement learning with action masking for differential-drive robot navigation using low-cost sensors**

Konstantinos Tsampazis (Aristotle University of Thessaloniki); Manos Kirtas (Aristotle University of Thessaloniki); Nikolaos Passalis (Aristotle University of Thessaloniki); Pavlos Tosidis (Aristotle University of Thessaloniki); Anastasios Tefas (Aristotle University of Thessaloniki)

32 **Path planning of multiple agents through probability flow**

Giovanni Di Gennaro (Università della Campania Luigi Vanvitelli); Amedeo Buonanno (ENEA, Department of Energy Technologies and Renewable Energy Sources); Francesco A. N. Palmieri (Universita della Campania Luigi Vanvitelli); Krishna Pattipati (University of Connecticut); Martina Merola (Università della Campania Luigi Vanvitelli)

Matrix factorization/completion

33 **Algorithms for Boolean matrix factorization using integer programming**

Christos Kolomvakis (University of Mons); Arnaud Vandaele (University of Mons); Nicolas Gillis (University of Mons)

34 **Accelerated algorithms for nonlinear matrix decomposition with the ReLU function**
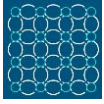
Giovanni Seraghiti (Università di Bologna); Atharva Abhijit Awari (Universite de Mons); Arnaud Vandaele (University of Mons); Margherita Porcelli (Università di Bologna); Nicolas Gillis (University of Mons)

Tour and Happy hour (18:30 – 21:00)

Meeting point: Piazza della Pilotta 4, Rome

Guided walking tour from the conference centre near the Trevi Fountain to Piazza Navona, visiting Pantheon, Sant'Eustachio, and Sant'Ivo alla Sapienza, where the Sapienza University, the largest of Europe, was born. In the end, happy hour in Campo de' Fiori!

The tour is free and the happy hour is optional, at the expense of the participants, payment on site. For any questions regarding this event, do not hesitate to write to eleonora.grassucci@uniroma1.it.

TUESDAY SEPTEMBER 19, 2023 (08:30 – 18:30)

08:00 – 18:30		Registration
08:30 – 10:00	Loyola Auditorium	Lecture 3 – Special Session "Multiview Representation Learning for Machine Learning and Data Fusion"
10:00 – 11:30	Loyola Auditorium	Lecture 4 – Special session "Efficient Bayesian Methods for Signal Processing"
11:30 – 12:00		Coffee Break
12:00 – 13:00	Loyola Auditorium	Keynote 3 – "Deep Learning and Dynamical Systems: A New Dawn for Signal Processing", Speaker: Mihaela Van Der Schaar
13:00 – 14:300		Lunch
14:30 – 16:30	Loyola Auditorium	Lecture 5 – Thematic Session on "Explainable and Reliable Machine Learning in Signal & Data Science"
16:30 – 18:30	Foscolo Hall	Poster Session 2 – "MLSP Applications 1" + Coffee Break
19:00 – 20:00	Monti	Guided walking tour in the amazing Monti
20:00 – 23:00	The Hive Hotel	Social Dinner

Lecture 3 – Special Session "Multiview Representation Learning for Machine Learning and Data Fusion"

Room: Loyola Auditorium (08:30 – 10:00)

Chairs: Tanuj Hasija, *Paderborn University*

      Timothy Marrinan, *Oregon State University*

08:30 – 08:50   **Independent vector analysis with sparse inverse covariance estimation: An application to misinformation detection**
Lucas P Damasceno (Federal University of Ceará); Egzona Rexhepi (American University); Allison Shafer (American University); Ian Whitehouse (American University); Charles C. Cavalcante (UFC); Roberto Corizzo (American University); Zois Boukouvalas (American University)

08:50 – 09:10   **MultiView independent component analysis with delays**
Ambroise Heurtebise (Inria Saclay); Pierre Ablin (Apple); Alexandre Gramfort (Meta)

09:10 – 09:30   **Geodesic-based relaxation for deep canonical correlation analysis**
Maurice Kuschel (Paderborn University); Timothy Marrinan (Pacific Northwest National Laboratory); Tanuj Hasija (Paderborn University)

09:30 – 09:50	**A time-aware tensor decomposition for tracking evolving patterns**

Christos Chatzis (Oslo Metropolitan University); Max Pfeffer (Georg-August-Universität Göttingen); Pedro Lind (Oslo Metropolitan University); Evrim Acar (Simula Metropolitan Center for Digital Engineering)

Lecture 4 – Special Session "Efficient Bayesian Methods for Signal Processing"

Room: Loyola Auditorium (10:00 – 11:30)

Chairs: Bert de Vries, *Eindhoven University of Technology*

Francesco A. N. Palmieri, *Università degli studi della Campania "Luigi Vanvitelli"*

10:00 – 10:18	**Reliable belief propagation: Recent theoretical and practical advances**

Christian Knoll (Graz, University of Technology); Franz Pernkopf (Graz University of Technology)

10:18 – 10:36	**Rao-Blackwellized Monte Carlo data association with deep metric for object tracking**

Ajinkya Gorad (Aalto University); Simo Särkkä (Aalto University)

10:36 – 10:54	**On NUP priors and Gaussian message passing**

Hans-Andrea Loeliger (ETH Zurich)

10:54 – 11:12	**Efficient Bayesian inference by conjugate-computation variational message passing**

Mykola Lukashchuk (Eindhoven University of Technology); Ismail Senoz (Eindhoven University of Technology); Bert de Vries (Eindhoven University of Technology)

11:12 – 11:30	**Improved variance predictions in approximate message passing**

Zilu Zhao (EURECOM); Dirk Slock (EURECOM)

Coffee break (11:30 – 12:00)

Keynote 3 – "Deep Learning and Dynamical Systems: A New Dawn for Signal Processing"

Speaker: Mihaela Van Der Schaar (*University of Cambridge*)

Room: Loyola Auditorium (12:00 – 13:00)

Chair: Michele Scarpiniti, *Sapienza University of Rome*

Lunch break (13:00 – 14:30)

Lecture 5 – Thematic Session on "Explainable and Reliable Machine Learning in Signal & Data Science"

Room: Loyola Auditorium (14:30 – 16:30)

Chair: Zheng-Hua Tan, *Aalborg University*

Panelists: Tülay Adali (*University of Maryland Baltimore County, USA*), Klaus-Robert Müller (*TU Berlin, Germany*), David Miller (*Pennsylvania State University, USA*), Sijia Liu (*Michigan State University, USA*)
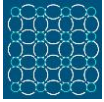
Poster Session 2 – "MLSP Applications 1"

Room: Foscolo Hall (16:30 – 18:30)

Chair: Eleonora Grassucci, *Sapienza University of Rome*

Biomedical and neural engineering
1 **FHSU-NET: Deep learning-based model for the extraction of fetal heart sounds in abdominal phonocardiography** *Mohanad Alkhodari (University of Oxford); Murad Almadani (Khalifa University); Samit Ghosh (Khalifa University); Ahsan Khandoker (Khalifa University)*
2 **Analysis of mild cognitive impairment utilizing covariance matrices of brain regions** *Ammu R (IIIT Bangalore); Neelam Sinha (IIIT Bangalore)*
3 **3D segmentation of unruptured intracranial aneurysms using task specific transfer learning and pure ConvNets** *Snigdha Agarwal (IIIT Bangalore); Neelam Sinha (IIIT Bangalore)*
4 **Unsupervised seizure detection in EEG using long short term memory network and clustering** *Samayan Bhattacharya (Jadavpur University); Alexis Bennett (University of Southern California); Celina Alba (University of Southern California); Kseniia Kriukova (University of Southern California); Dominique Duncan (University of Southern California)*
5 **A Flow Artist for high-dimensional cellular data** *Kincaid Macdonald (Yale University); Dhananjay Bhaskar (Yale University); Guy Thampakkul (Pomona College); Nhi Nguyen (Yale University); Joia Zhang (University of Washington); Michael Perlmutter (University of California, Los Angeles); Ian Adelstein (Yale University); Smita Krishnaswamy (Yale University)*

6 **Geodesic Sinkhorn for fast and accurate optimal transport on manifolds**

Guillaume Huguet (Université de Montréal; Mila); Alexander Y. Tong (Mila; Universite de Montreal); Maria Ramos (University College London); Christopher Tape (University College London); Guy Wolf (Université de Montréal); Smita Krishnaswamy (Yale University)

7 **Using sparse autoencoders to perform blind source separation of high-density myoelectric signal**

Marcelo R. Romano (University of Campinas); Leonardo Tomazeli Duarte (University of Campinas); Leonardo A. Elias (University of Campinas)

8 **Bayesian deep learning detection of anomalies and failure: Application to medical images**

Giuseppina Carannante (Rowan University); Nidhal Bouaynaya (Rowan University)

Image and video processing

9 **Holistic FOD detection via surface map and yolo networks**

Sirui Song (Ohio University); Xi Qin (Ohio University); Jackson Brengman (Ohio University); Chris Bartone (Ohio University); Jundong Liu (Ohio University)

10 **Semantic-aware image compressed sensing**

Bowen Zhang (Imperial College London); Zhijin Qin (Tsinghua University); Geoffrey Li (Imperial College London)

11 **Spatial encoding of EEG brain wave signals to predict student's mental state during E-learning**

Saikrishna Kopparapu (IIIT Bangalore); Debanjali Bhattacharya (IIIT Bangalore); Neelam Sinha (IIIT Bangalore)

12 **Scale selection network with attention mechanism for crowd counting**

Ting-Hsu Lai (National Chung Hsing University); Tsung-Jung Liu (National Chung Hsing University); Kuan-Hsien Liu (National Taichung University of Science and Technology)

Music, speech, and audio processing

13 **Improved vocal effort transfer vector estimation for vocal effort-robust speaker verification**

Iván López-Espejo (Aalborg University); Santi Prieto (Veridas); Alfohso Ortega (Universidad de Zaragoza); Eduardo Lleida Solano (University of Zaragoza)

14 **Dynamic nsNet2: Efficient deep noise suppression with early exiting**

Riccardo Miccini (Technical University of Denmark); Alaa Zniber (International University of Rabat); Clement Laroche (GN Audio); Tobias Piechowiak (Jabra); Martin Schoeberl (DTU); Luca Pezzarossa (Technical University of Denmark); Ouassim Karrakchou (International University of Rabat); Jens Sparsø (Technical University of Denmark); Mounir Ghogho (Université Internationale de Rabat)

15 **Air drums, and bass: anticipating musical gestures in accelerometer signals with a lightweight CNN**

Tiago F. Tavares (Insper); Lucas Bertoloto (Unicamp)

16 **IANS: Intelligibility-aware null-steering beamforming for dual-microphone arrays**

Wen-Yuan Ting (National Taiwan University); Syu-Siang Wang (Yuan Ze University); Yu Tsao (Academia Sinica); Borching Su (National Taiwan University)

17 **Low-complexity streaming speech super-resolution**

Erfan Soltanmohammadi (Amazon Web Services, Inc.); Paris Smaragdis (University of Illinois at Urbana-Champaign); Michael M. Goodwin (AWS)

18 **An enhanced system for the detection and active cancellation of snoring signals**

Valeria Bruschi (Università Politecnica delle Marche); Michela Cantarini (Università Politecnica delle Marche); Luca Serafini (Università Politecnica delle Marche); Stefano Nobili (Leaff Engineering); Stefania Cecchi (Università Politecnica delle Marche); Stefano Squartini (Università Politecnica delle Marche)

Other applications including social networks, smart grid, security, and privacy

19 **Graph-based multi-task learning for fault detection in smart grid**

Dibaloke Chanda (Marquette University); Nasim Yahyasoltani (Marquette University)

20 **Online computation of reduced Egonet features for anomaly detection in bank transactions graphs**

Cristian-Enache Zica (University Politehnica of Bucharest); Bogdan Dumitrescu (University Politehnica of Bucharest)

21 **Deep extreme learning machine with its application to body-conducted-sound-based handwork recognition**

Akira Sasou (AIST); Satoki Ogiso (AIST); Akihiko Nagakubo (AIST)

22 **Quantization-aware training for mixed precision photonic neural networks**

Manos Kirtas (Aristotle University of Thessaloniki); Nikolaos Passalis (Aristotle University of Thessaloniki); Athina Oikonomou (Aristotle University of Thessaloniki); Miltos Moralis-Pegios (Aristotle University of Thessaloniki); George Giamougiannis (Aristotle University of Thessaloniki); Apostolos Tsakyridis (Aristotle University of Thessaloniki); George Mourgias-Alexandris (Aristotle University of Thessaloniki); Nikolaos Pleros (Aristotle University of Thessaloniki); Anastasios Tefas (Aristotle University of Thessaloniki)

23 **Robot motion prediction by channel state information**

Rojin Zandi (Northeastern University); Hojjat Salehinejad (Mayo Clinic); Kian Behzad (Northeastern University); Elaheh Motamedi (Northeastern University); Milad Siami (Northeastern University)

Pattern recognition and classification

24 **Underwater acoustic signal classification using hierarchical audio transformer with noisy input**

Quoc T. Vo (Drexel University); David K. Han (Drexel University)

25 **Low-count time series anomaly detection**

Philipp Renz (Johannes Kepler University Linz, ELLIS Unit Linz, LIT AI Lab, Institute for Machine Learning); Kurt Cutajar (Amazon); Niall Twomey (Amazon); Gavin Cheung (Amazon Prime Video); Hanting Xie (Amazon)

26 **On the failure of invariant risk minimization and an effective fix via classification error control**

Thuan Nguyen (Tufts University); Matthias Scheutz (Tufts University); Shuchin Aeron (Tufts University)

27 **An algorithm based on topological data analysis for solving unsupervised machine learning problems**

Mehdi Kafashan (Mastercard); Wally Lo Faro (Mastercard)

28 **Post-hoc explainability of BI-RADS descriptors in a multi-task framework for breast cancer detection and segmentation**

Mohammad Karimzadeh (University of Idaho); Aleksandar Vakanski (University of Idaho); Min Xian (University of Idaho); Boyu Zhang (University of Idaho)

Efficient Bayesian Methods for Signal Processing

29 **Belief propagation of Pareto front in multi-objective MDP graphs**

Francesco Palmieri (Università della Campania Luigi Vanvitelli); Krishna Pattipati (University of Connecticut); Giovanni Di Gennaro (Università della Campania Luigi Vanvitelli); Amedeo Buonanno (ENEA); Caterina Fedele (Università della Campania Luigi Vanvitelli)

30 **Gaussian process amplitude demodulation by message-passing**

Hoang M. H. Nguyen (Eindhoven University of Technology); Ismail Senoz (Eindhoven University of Technology); Bert de Vries (Eindhoven University of Technology)

31 **Greedy online change point detection**

Jou-Hui Ho (Universidad de Chile); Felipe Tobar (Universidad de Chile)

32 **Amortized variational peak fitting for spectroscopic data**

David Frich Hansen (Technical University of Denmark); Tommy Sonne Alstrøm (Technical University of Denmark); Mikkel N. Schmidt (Technical University of Denmark)

Multiview representation learning for machine learning and data fusion

33 **Effective adaptation into new environment with few shots: Applications to OFDM receiver design**

Ouya Wang (Imperial College London); Shenglong Zhou (Beijing Jiaotong University); Geoffrey Li (Imperial College)

34 **Multi-view self-supervised learning for multivariate variable-channel time series**

Thea Brüsch (Technical University of Denmark); Mikkel N. Schmidt (Technical University of Denmark); Tommy Sonne Alstrøm (Technical University of Denmark)

Guided walking tour in the amazing Monti (19:00 – 20:00)

Meeting point: Piazza della Pilotta 4, Rome

Guided walking tour in the amazing Monti, one of the oldest Rome neighbourhoods, and Basilica di Santa Maria Maggiore, where there is a tribute of Romans to the famous sculptor Gian Lorenzo Bernini. The end of the tour is at the social dinner at The Hive Hotel.
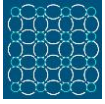
Social Dinner (20:00 – 23:00)

Location: The Hive Hotel, Via Torino 6, Rome

WEDNESDAY SEPTEMBER 20, 2023 (09:30 – 19:00)

09:00 – 17:00		Registration
09:30 – 13:00	Foscolo Hall	Show & Tell Demo
09:30 – 11:30	Loyola Auditorium	Lecture 6 - "Industry Session"
11:30 – 12:00		Coffee Break
12:00 – 13:00	Loyola Auditorium	Keynote 4 - "Generative models for digital humans", Speaker: Stefanos Zafeiriou
13:00 – 14:30		Lunch
14:30 – 16:00	Loyola Auditorium	Lecture 7 - "Deep Generative Models"
16:00 – 16:30	Loyola Auditorium	Awards and Closing Greetings
16:30 – 18:30	Foscolo Hall	Poster Session 3 - "MLSP Applications 2" + Coffee Break
19:00 – 23:00	Trastevere	Tour and pizza

Show & Tell Demo: As Light as Your Footsteps: A shoe-based wearable device for real-time modification of footstep sounds for illusory changes in body weight

Authors: *Amar D'Adamo (Universidad Carlos III de Madrid); Mohammad Mahdi Dehshibi (Universidad Carlos III de Madrid); Daniel De la Prida Caballero (Universidad Carlos III de Madrid); Joaquín R. Díaz Durán (Universidad Carlos III de Madrid); Luis Antonio Azpicueta-Ruiz (Universidad Carlos III de Madrid); Ana Tajadura-Jiménez (Universidad Carlos III de Madrid / University College London)*

Room: Foscolo Hall (09:30 – 13:00)

Lecture 6 – "Industry Session"

Room: Loyola Auditorium (09:30 – 11:30)

Chair: Amedeo Buonanno, *ENEA*

09:30 – 10:00   **Core hearing instruments signal processing with machine learning – What's next**
Niels H. Pontoppidan (*Eriksholm Research Centre – Oticon A/S*)

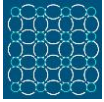|	
10:00 – 10:20	**Machine learning for characterisation of emotion and stress from voice** *Ladan Ravary (Aculab), Steve Beet (Aculab)*
10:20 – 10:50	**Foundation models for speech** *Sébastien Bratières (Translated)*
10:50 – 10:55	**Machine learning for signal processing at Musixmatch** *Francesco Bonzi (Musixmatch)*
10:55 – 11:10	**Exploiting music source separation for singing voice detection** *Francesco Bonzi (Musixmatch); Michele Mancusi (Sapienza University of Rome); Simone Del Deo (Musixmatch); Pierfrancesco Melucci (Musixmatch); M. Stella Tavella (Musixmatch); Loreto Parisi (Musixmatch); Emanuele Rodola (Sapienza University of Rome)*
11:10 – 11:15	**I.M.A. – Intelligent Maritime Awareness** *Francesco Borghese (Elman, Srl)*
11:15 – 11:30	**Sailing the SeaFormer: A transformer-based model for vessel route forecasting** *Luigi Sigillo (Sapienza University of Rome); Alessandro Marzilli (Sapienza University of Rome); Daniela Moretti (Sapienza University of Rome); Eleonora Grassucci (Sapienza University of Rome); Claudio Greco (Elman); Danilo Comminiello (Sapienza University of Rome)*

Coffee break (11:30 – 12:00)

Keynote 4 – "Generative models for digital humans"

Speaker: Stefanos Zafeiriou (*Imperial College London*)

Room: Loyola Auditorium (12:00 – 13:00)

Chair: Danilo Comminiello, *Sapienza University of Rome*

Lunch break (13:00 – 14:30)

Lecture 7 – "Deep Generative Models"

Room: Loyola Auditorium (14:30 – 16:30)

Chairs: Eleonora Grassucci, *Sapienza University of Rome*

Michele Scarpiniti, *Sapienza University of Rome*

14:30 – 14:47	**Artificial ASMR: A cyber-psychological approach** *Zexin Fang (Rhineland-Palatinate University of Technology Kaiserslautern-Landau); Bin Han (RPTU Kaiserslautern-Landau); Clark Cao (Lingnan University); Hans D. Schotten (RPTU Kaiserslautern-Landau)*
14:47 – 15:04	**Distributed compressed sensing with personalized variational auto-encoders** *Zhuojun Tian (Zhejiang University); Zhaoyang Zhang (Zhejiang University); Richeng Jin (Zhejiang University); Lei Liu (Zhejiang University); Zhaohui Yang (Zhejiang University)*
15:04 – 15:21	**Multi-contrast MRI image translation via pathology-aware generative adversarial networks** *Mohamed M. AbdAllah (Cairo University); Mohamed Rasmy (Cairo University); Muhammad A. Rushdi (Cairo University)*
15:21 – 15:38	**A probabilistic semi-supervised approach with triplet Markov chains** *Katherine Tania Morales (Télécom SudParis); Yohan Petetin (Télécom SudParis)*
15:38 – 15:55	**GFlowNets for sensor selection** *Spilios Evmorfos (Rutgers University); Zhaoyi Xu (Rutgers University); Athina Petropulu (Rutgers University)*

Awards and Closing Greetings
Room: Loyola Auditorium (16:00 – 16:30)

Poster Session 3 – "MLSP Applications 2"

Room: Foscolo Hall (16:30 – 18:30)

Chair: Giovanni Di Gennaro, *Università degli studi della Campania "Luigi Vanvitelli"*

Biomedical and neural engineering

1	**FOREST: White matter fiber orientation estimation using deep learning in diffusion MRI** *Ashutosh Vaish (Indraprastha Institute of Information Technology, Delhi); Mihir Chaturvedi (Indraprastha Institute of Information Technology, Delhi); Anubha Gupta (Indraprastha Institute of Information Technology, Delhi); Ajit Rajwade (IIT Bombay)*

2 **RASTER: Representation learning for time series classification using scatter score and randomized threshold exceedance rate**
Alireza Keshavarzian (University of Toronto); Shahrokh Valaee (University of Toronto)

3 **Concept-based explainability for an EEG transformer model**
Anders Gjølbye Madsen (Technical University of Denmark); William T. Lehn-Schiøler (BrainCapture); Ashildur Jonsdottir (Technical University of Denmark); Bergdis Arnardottir (Technical University of Denmark); Lars Kai Hansen (Technical University of Denmark)

4 **View it like a radiologist: shifted windows for deep learning augmentation of CT images**
Eirik Agnalt Østmo (UiT - The Arctic University of Norway); Kristoffer K. Wickstrøm (UiT - The Arctic University of Norway); Keyur Radiya (UNN); Michael C. Kampffmeyer (UiT - The Arctic University of Norway); Robert Jenssen (UiT - The Arctic University of Norway)

Image and video processing

5 **Coded distributed image classification**
Jiepeng Tang (University of Melbourne); Navneet Agrawal (TU Berlin); Slawomir Stanczak (Fraunhofer HHI); Jingge Zhu (University of Melbourne)

6 **Sustainable edge intelligence through energy-aware early exiting**
Marcello Bullo (Imperial College London); Seifallah Jardak (Toshiba Europe Ltd); Pietro Carnelli (Toshiba Europe Ltd); Deniz Gunduz (Imperial College London)

Applications in Communications

7 **Contrastive representation of channel state information for human body orientation recognition in interaction with machines**
Hojjat Salehinejad (Mayo Clinic); Navid Hasanzadeh (University of Toronto); Radomir Djogo (University of Toronto); Shahrokh Valaee (University of Toronto)

8 **Dual-path model with Fresnel zone-based voting for human activity recognition using Wi-Fi**
Radomir Djogo (University of Toronto); Hojjat Salehinejad (Mayo Clinic); Navid Hasanzadeh (University of Toronto); Shahrokh Valaee (University of Toronto)

9 **Physics-informed neural networks for pathloss prediction**
Steffen Limmer (Siemens AG); Alberto Martinez Alba (Siemens AG); Nicola Michailow (Siemens AG)

10 **Adaptive pre-processing for neural network hardware deployment**
Dario Del Gaizo (KTH); Francesco De Palo (Rheinmetall Italia S.p.A.); Fabio Cipriani (Rheinmetall Italia S.p.A.); Luca Giancane (Rheinmetall Italia S.p.A.)

Music, speech, and audio processing

11 **Predicting room impulse responses through encoder-decoder convolutional neural networks**
Ignacio Martin-Salinas (Universidad Carlos III); Francisco Pastor-Naranjo (Universitat Politècnica de Valencia); Felix Fuentes-Hurtado (Universidad Politécnica de Madrid); Jose A. Belloch (Universidad Carlos III de Madrid); Luis Azpicueta (Universidad Carlos III); Valery Naranjo (Universitat Politècnica de València); Gema Piñero (Universitat Politècnica de València)
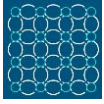
12 **Voice direction-of-arrival conversion**

I-Chun Chern (Carnegie Mellon University); Steffi Chern (Carnegie Mellon University); Heng-Cheng Kuo (Academia Sinica); Huan-Hsin Tseng (Brookhaven National Laboratory); Kuo-Hsuan Hung (Academia Sinica); Yu Tsao (Academia Sinica)

13 **NAaLOSS: rethinking the objective of speech enhancement**

Kuan-Hsun Ho (NTNU); En-Lun Yu (National Taiwan Normal University); Jeih-weih Hung (National Chi Nan University); Berlin Chen (National Taiwan Normal University)

14 **A U-Net based architecture for automatic music transcription**

Michele Scarpiniti (Sapienza University of Rome); Edoardo Sigismondi (Sapienza University of Rome); Danilo Comminiello (Sapienza University of Rome); Aurelio Uncini (Sapienza University of Rome)

15 **Optimal subband adaptive filtering algorithm over functional link neural network**

Jianhong Ye (Southwest University of Science and Technology); Yi Yu (Southwest University of Science and Technology); Badong Chen (Xi'an Jiaotong University, China); Zongsheng Zheng (Sichuan University)

16 **Compressing wav2vec2 for embedded applications**

Oswaldo Ludwig (Cerence Inc.); Tom Claes (Cerence Inc.)

Source separation

17 **DOA uncertainty quantification with conformal prediction**

Ishan D. Khurjekar (Scripps Institute of Oceanography); Peter Gerstoft (UCSD)

18 **Unsupervised domain adaptation of universal source separation based on neural full-rank spatial covariance analysis**

Takahiro Aizawa (Tokyo Institute of Technology; AIST); Yoshiaki Bando (National Institute of Advanced Industrial Science and Technology); Katsutoshi Itoyama (Tokyo Institute of Technology); Kenji Nishida (Tokyo Institute of Technology); Kazuhiro Nakadai (Tokyo Institute of Technology); Masaki Onishi (AIST)

19 **Blind processing methods for quantum channels: Identification, equalization and source separation**

Yannick Deville (University of Toulouse); Alain Deville (Aix-Marseille Université)

Distributed/Federated learning

20 **Privacy-preserving federated primal-dual learning for non-convex problems with non-smooth regularization**

Yiwei Li (National Tsing Hua University); Chien-Wei Huang (National Tsinghua University); Shuai Wang (Singapore University of Technology and Design); Chong-Yung Chi (National Tsing Hua University); Tony Quek (Singapore University of Technology and Design)

21 **Distributed stable outlier-robust signal recovery using minimax concave loss**

Maximilian H. V. Tillmann (Keio University); Masahiro Yukawa (Keio University)

22 **Decentralized stochastic projection-free learning with compressed push-sum**

Robin Francis (Indian Institute of Science, Bangalore); Sundeep Prabhakar Chepuri (Indian Institute of Science)

23 **Distributed dual coordinate ascent with imbalanced data on a general tree network**

Myung Cho (Penn State Behrend); Lifeng Lai (UC Davis); Weiyu Xu (University of Iowa)

24 **Federated cooperative 3D object detection for autonomous driving**

Fangyuan Chi (The University of British Columbia); Yixiao Wang (University of British Columbia); Panos Nasiopoulos (University of British Columbia); Victor C. M. Leung (Shenzhen University)

MLSP Data Competitions

25 **Volunteer retention and future collaboration prediction in volunteer crowdsourcing platforms**

Shutong Chen (Tsinghua University); Anping Zhang (Tsinghua University); Qiqi Chen (Tsinghua University); Yang Li (Tsinghua-Berkeley Shenzhen Institute)

26 **An ensemble link prediction framework with AUC-guided leaderboard probing for volunteer collaboration prediction challenge**

Yuxuan Xiu (Tsinghua University); Wenxin Liu (Tsinghua University); Keng Hou Leong (Tsinghua University); Xinyue Ren (Tsinghua University); Bokui Chen (Tsinghua University); Victor Chan (Tsinghua-Berkeley Shenzhen Institute)

27 **HTGTM: Hybrid temporal-graph tabular model for complex multimodal tabular data processing**

Ziwen Liu (University College London); Scott Orr (University College London); Josep Grau-Bove (University College London)

28 **Volunteer future collaboration prediction with topology-based ensemble models**

Wenyue Xi (New York University); Ruiying Liu (Smith College); Rui Cui (Amazon)

29 **An ensemble learning approach for volunteer retention prediction**

Fanfan Zhao (Tsinghua University); Yuanquan Hu (Tsinghua University); Victor Chan (Tsinghua-Berkeley Shenzhen Institute)

30 **Overview of the urban wireless localization competition**

Cagkan Yapar (TU Berlin); Fabian Jaensch (TU Berlin); Ron Levie (Technion); Gitta Kutyniok (Ludwig Maximilian University of Munich); Giuseppe Caire (TU Berlin)

31 **LocSwinUNet: A hyper-accurate urban wireless localization method for TOA and RSS radio maps**

Minghui Hu (Nanyang Technological University); Saihua Xu (Nil); Qinglai Liu (Nanyang Technological University); Mayur Vitthalrao Katwe (Nanyang Technological University); Chau Yuen (Nanyang Technological University); Sirajudeen Gulam Razul (Nil)

Other Applications of MLSP

32 **Joint structural and functional connectivity learning based independent component analysis**

Mahshid Fouladivanda (Tri-institutional Center for Translational Research in Neuroimaging and Data Science (TReNDS); Armin Iraji (Georgia State University); Lei Wu (Georgia State University); Vince Calhoun (TReNDS)

33 **AdvRevGan: On reversible universal adversarial attacks for privacy protection applications**
Stefania Altini (Aristotle University of Thessaloniki); Vasileios Mygdalis (Aristotle University of Thessaloniki); Ioannis Pitas (Aristotle University of Thessaloniki)

34 **MIMO radar waveform synthesis using generative adversarial networks**
Vesa Saarinen (Aalto University); Visa Koivunen (Aalto University)

Tour and pizza (19:00 – 23:00)

<u>Meeting point</u>: Piazza della Pilotta 4, Rome

Guided walking tour in Trastevere, the most vibrant and typical Rome neighbourhood. The tour will end in Ripa Grande, a famous Italian pizzeria to eat pizza like Italians do!

The tour is free and the pizza is optional, at the expense of the participants (dinner price 40€), payment on site. For any questions regarding this event, do not hesitate to write to eleonora.grassucci@uniroma1.it.

Keynote 1 - Multivariate measures of statistical dependence

Prof. José C. Príncipe, *University of Florida*

Abstract: This talk presents a novel multivariate definition of statistical dependence using a functional methodology inspired by Alfred Rényi. We define a new symmetric and self-adjoint cross density kernel through a recursive bidirectional statistical mapping between conditional densities of continuous random processes, which directly estimates their statistical dependence.
The formulation requires fewer assumptions about the data generation model than current methods. The measure can also be estimated from realizations. The proposed functional maximum correlation algorithm (FMCA) is applied to a learning architecture with two multivariate neural networks that learn in tandem. Preliminary results with synthetic data and medium size image datasets corroborate the theory.

Speaker's Bio: José C. Príncipe is Distinguished Professor of Electrical and Biomedical Engineering at the University of Florida since 2002. He joined the University of Florida in 1987, after an eight-year appointment as Professor at the University of Aveiro, in Portugal. Dr. Principe holds degrees in electrical engineering from the University of Porto (Bachelor), Portugal, University of Florida (Master and Ph.D.), USA. He created in 1991 the Computational NeuroEngineering Laboratory to synergistically focus the research in biological information processing models.

Schedule: September 17, 2023 – 6:00 PM, Cloister Hall, Sapienza University of Rome

Keynote 2 - Machine learning for the sciences – Toward understanding

Prof. Klaus-Robert Müller, *Technische Universität Berlin*

Abstract: In recent years, machine learning (ML) and artificial intelligence (AI) methods have begun to play a more and more enabling role in the sciences and in industry. In particular, the advent of large and/or complex data corpora has given rise to new technological challenges and possibilities. In his talk, Müller will touch upon the topic of ML applications in the sciences, in particular in physics, chemistry and medicine. He will also discuss possibilities for extracting information from machine learning models to further our understanding by explaining nonlinear ML models. Finally, Müller will briefly discuss perspectives and limitations.

Speaker's Bio: Klaus-Robert Müller has been a professor of computer science at Technische Universität Berlin since 2006; at the same time he is directing rsp. co-directing the Berlin Machine Learning Center and the Berlin Big Data Center and most recently BIFOLD . He studied physics in Karlsruhe from1984 to 1989 and obtained his Ph.D. degree in computer science at Technische Universität Karlsruhe in 1992. After completing a postdoctoral position at GMD FIRST in Berlin, he was a research fellow at the University of Tokyo from 1994 to 1995. In 1995, he founded the
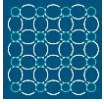
Intelligent Data Analysis group at GMD-FIRST (later Fraunhofer FIRST) and directed it until 2008. From 1999 to 2006, he was a professor at the University of Potsdam. From 2012 he has been Distinguished Professor at Korea University in Seoul. In 2020/2021 he spent his sabbatical at Google Brain as a Principal Scientist. Among others, he was awarded the Olympus Prize for Pattern Recognition (1999), the SEL Alcatel Communication Award (2006), the Science Prize of Berlin by the Governing Mayor of Berlin (2014), the Vodafone Innovations Award (2017), Pattern Recognition Best Paper award (2020), Digital Signal Processing Best Paper award (2022). In 2012, he was elected member of the German National Academy of Sciences-Leopoldina, in 2017 of the Berlin Brandenburg Academy of Sciences, in 2021 of the German National Academy of Science and Engineering and also in 2017 external scientific member of the Max Planck Society. From 2019 on he became an ISI Highly Cited researcher in the cross-disciplinary area. His research interests are intelligent data analysis and Machine Learning in the sciences (Neuroscience (specifically Brain-Computer Interfaces, Physics, Chemistry) and in industry.

Schedule: September 18, 2023 – 12:00 PM, Loyola Auditorium, Fontana di Trevi Congress Center

Keynote 3 - Deep Learning and Dynamical Systems: A New Dawn for Signal Processing

Prof. Mihaela Van Der Schaar, *University of Cambridge*

Abstract: TBC

Speaker's Bio: Mihaela van der Schaar is John Humphrey Plummer Professor of Machine Learning, Artificial Intelligence and Medicine at the University of Cambridge, where she leads the van der Schaar Lab, a Turing Faculty Fellow at The Alan Turing Institute in London, a Chancellor's Professor at UCLA and an IEEE Fellow.
In 2020, Mihaela was among the top 10 authors not only at ICML, but also at NeurIPS, two of the world's most prestigious machine learning conferences. In 2019, she was identified by NESTA as the UK-based female researcher with the most citations in the field of AI.
Professor van der Schaar's many awards include the Oon Prize on Preventative Medicine from the University of Cambridge (2018), a National Science Foundation Career Award, numerous best paper awards, including the IEEE Darlington Award. She holds dozens of patents. Above all, Professor van der Schaar's passion is to make a positive impact on people's lives by applying machine learning and AI to the unique challenges in healthcare and medicine.

Schedule: September 19, 2023 – 12:00 PM, Loyola Auditorium, Fontana di Trevi Congress Center

Keynote 4 - Generative models for digital humans

Prof. Stefanos Zafeiriou, *Imperial College London*

Abstract: The past ten years we have witnessed a paradigm shift in the way we are processing, analyzing and generating data. The shift was made due to many factors including (a) the advent of deep learning as the main learning paradigm, (b) the availability of huge amount of information through the internet and (c) the availability of GPUs are other similar hardware technologies. In this talk I will discuss recent advances on deep learning for analyzing, processing and generating content that revolves around humans. I will discuss how data available on the web has radically changed the field. I will discuss various generative approaches for synthesing digital humans in 2D/3D (i.e., with explicit asset-based models or neurally rendered).

Speaker's Bio: Stefanos Zafeiriou is currently a Professor in Machine Learning and Computer Vision with the Department of Computing, Imperial College London and an EPSRC Early Career Research Fellow. Between 2016-2020 he was also a Distinguishing Research Fellow with the University of Oulu under the Finish Distinguishing Professor Programme. He was a recipient of the Prestigious Junior Research Fellowships from Imperial College London in 2011. He was the recipient of the President's Medal for Excellence in Research Supervision in 2016 and the corresponding Medal for Entrepreneurship & Innovation in 2022. He has co-authored over 250 papers in the most prestigious journals and conferences of his field. His work has more than 29,000 citations, h-index of 72 (source: Google Scholar). He has graduated over 40 PhD students who are currently working in top industrial players (i.e., Google, Meta, Apple, Amazon, Huawei, Snap, Roche, Bloomberg, Citadel etc.) or academia. He has co-founded many successful start-ups in the areas of computer vision (digital humas), language analysis and Brain-Computer Interfaces (BCI).

Schedule: September 20, 2023 – 12:00 PM, Loyola Auditorium, Fontana di Trevi Congress Center