MLSP 2025

35th IEEE International Workshop on Machine Learning for Signal Processing

"Signal Processing in the Age of Large Language Models"

AUGUST 31 - SEPTEMBER 3 ISTANBUL / TÜRKİYE

Welcome to IEEE MLSP 2025, *Signal Processing in the age of Large Language Models*,

On behalf of the organizing committee, it is our great pleasure to welcome you to the 35th IEEE International Workshop on Machine Learning for Signal Processing (IEEE MLSP 2025), which will be held between August 31 - September 3, 2025, in Istanbul, Turkey.

The IEEE MLSP is the main and oldest technical event sponsored by the Machine Learning for Signal Processing (MLSP) Technical Committee of the IEEE Signal Processing Society. Its primary objective is to bring together leading experts, researchers, and industry professionals to explore the latest advancements, challenges, and opportunities in machine learning for signal processing.

This year the theme of the workshop will be 'Signal Processing in the age of Large Language Models'. This year we have five special sessions, and three data competition sessions. We also brought forward several changes to the workshop that includes the presentation of SPS papers, ICASSP papers, poster presentation for all papers, and use of OpenReview for reviewing platform. We worked very hard to make it a good conference.

We look forward to welcoming you to İstanbul, a city with a rich history, and extraordinary natural scenery.

Sincerely,
General Chairs of IEEE MLSP 2025

Contents

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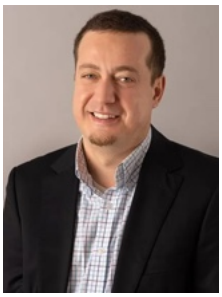

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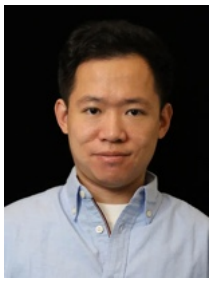


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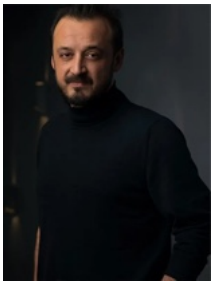

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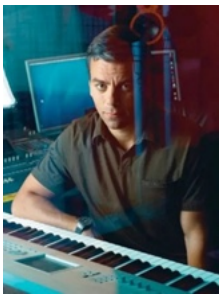

Conference Management: Mustafa Bay, Ece Sayıt


Program-at-a-Glance

		Sunday, August 31	Monday, Sep 1	Tuesday, Sep 2	Wednesday, Sep 3
Morning	8.00 - 8.30	Registration	Registration	Registration	Registration
	8.30 - 9.00		IAPR Keynote - David G. Stork		
	9.00 - 9.30	**Tutorial 1:** Geometric and Topological Representation Learning	Oral Session 1	Oral Session 3	Oral Session 5
	9.30 - 10.00				
	10.00 - 10.30				
	10.30 - 11.00	Coffee Break	Coffee Break	Coffee Break	Coffee Break
	11.00 - 11.30	**Tutorial 1:** Geometric and Topological Representation Learning	Keynote 2: Volkan Cevher	Keynote 3: Urbashi Mitra	Keynote 4: Alexandre Gramfort
	11.30 - 12.00				
Lunch	12.00 - 12.30				
	12.30 - 13.00				
	13.00 - 13.30				
Afternoon	13.30 - 14.00	**Tutorial 2:** Learning with Covariance Matrices: Foundations and Applications to Network Neuroscience	Brain Decoding, invited talk	SA, Data Competition talk(s)	Industry Presentations and Panel
	14.00 - 14.30		Oral Session 2	Oral Session 4	
	14.30 - 15.00				
	15.00 - 15.30	Coffee Break			Closing Remarks
	15.30 - 16.00	**Tutorial 3:** Integration of Physics-Based and Data-Driven Models for Parameter Estimation with Applications to Image and Speech Signal Processing	Coffee Break	Coffee Break	Coffee Break
	16.00 - 16.30		Poster Session 1 + Industrial-Academic Joint Workshop on Speech and Audio	Poster Session 2	Poster Session 3
	16.30 - 17.00				
	17.00 - 17.30	Keynote 1: Arnaud Doucet			
	17.30 - 18.00				
Evening	18.00 - 18.30	Opening + Welcome Reception	Social Event 1	Banquet Dinner on the Boat	Social Dinner
	18.30 - 19.00				
	19.00 - 19.30				
	19.30 - 20.00				
	20.00 - 20.30				
	20.30 - 21.00				

Daily Program

Sunday, 31st of August

8:00–9:00	**Registration**
9:00–10:30	**Tutorial1: Geometric and Topological Representation Learning**
10:30-11:00	**Coffee Break**
11:00–12:00	**Tutorial1: Geometric and Topological Representation Learning**
12:00–13:30	**Lunch Break**
13:30–15:00	**Tutorial2: Learning with Covariance Matrices: Foundations and Applications to Network Neuroscience**
15:00-15:30	**Coffee Break**
15:30–17:00	**Tutorial3: Integration of Physics-Based and Data-Driven Models for Parameter Estimation and Applications to Image and Speech Processing**
17:00-18:00	**Keynote Talk: Arnaud Doucet** **From Diffusion Models to Schrodinger Bridges: Generative Modeling Meets Optimal Transport**
18:00–21:00	**Opening + Welcome Reception**

Monday, 1st of September

8:00–8:30	**Registration**
8:30–9:00	**Invited Talk: David Stork (Special Session: AI in Cultural Heritage)**
9:00-10:30	**Oral Session 1: Signal Decomposition and Estimation**
10:30-11:00	**Coffee Break**
11:00-12:00	**Keynote Talk: Volkan Cevher Training Neural Networks at Any Scale**
12:00–13:30	**Lunch Break**
13:30–14:00	**Invited Talk: (Special Session: Brain Decoding)**
14:00-15:30	**Oral Session 2: Audio, Speech and Music Processing**
15:30-16:00	**Coffee Break**
16:00-18:00	**Poster Session 1**
16:00-18:00	**Huawei Industrial Event**
18:00–21:00	**Social Dinner**

Tuesday, 2nd of September

8:00–9:00	**Registration**
9:00-10:30	**Oral Session 3:** **Learning Algorithms and Optimization**
10:30-11:00	**Coffee Break**
11:00-12:00	**Keynote Talk: Urbashi Mitra** **Digital Cousins: Generative Multi-Environment Mixed Q-Learning**
12:00–13:30	**Lunch Break**
13:30–14:00	**Data Competition Session:** **Sampling-Assisted Pathloss Radio Map Prediction**
14:00-15:30	**Oral Session 4:** **Computer Vision**
15:30-16:00	**Coffee Break**
16:00-18:00	**Poster Session 2**
18:00–21:00	**Banquet Dinner**

Wednesday, 3rd of September

8:00–9:00	**Registration**
9:00-10:30	**Oral Session 5: ML for Health and Neuroscience**
10:30-11:00	**Coffee Break**
11:00-12:00	**Keynote Talk: Alexandre Gramfort Training machines to decode electromyography signals for high bandwidth human-computer interfaces that work across people**
12:00–13:30	**Lunch Break**
13:30–15:00	**Industry Panel**
15:00–15:30	**Closing Remarks and Best Paper Awards**
14:00-15:30	**Oral Session 5: ML for Health and Neuroscience**
15:30-16:00	**Coffee Break**
16:00-18:00	**Poster Session 3**
18:00–21:00	**Social Dinner**

Sunday, August 31st

From Diffusion Models to Schrodinger Bridges: Generative Modeling Meets Optimal Transport

Arnaud Doucet

Google DeepMind

Abstract: Diffusion models have revolutionized generative modeling. Conceptually, these methods define a transport mechanism from a noise distribution to a data distribution. Recent advancements have extended this framework to define transport maps between arbitrary distributions, significantly expanding the potential for unpaired data translation. However, existing methods often fail to approximate optimal transport maps, which are theoretically known to possess advantageous properties. In this talk, we will show how one can modify current methodologies to compute Schrödinger bridges—an entropy-regularized variant of dynamic optimal transport. We will demonstrate this methodology on a variety of unpaired data translation tasks.

Speaker Bio: *Arnaud Doucet is a Senior Staff Research Scientist at Google DeepMind. He earned his Ph.D. in Electrical Engineering from the University of Paris-XI Orsay in 1997. Over the years, he has held research positions at Oxford University, Cambridge University and the University of Melbourne before joining Google Deepmind in 2023. His research focuses on Bayesian methods, computational statistics, Monte Carlo methods, and generative modeling. Doucet has received several prestigious honors, including being named an Institute of Mathematical Statistics (IMS) Fellow in 2017, delivering the IMS Medallion Lecture in 2016, and receiving the Guy Silver Medal from the Royal Statistical Society in 2020. His recent work explores denoising diffusion models and computational optimal transport, with numerous publications featured in top statistical and machine learning journals.*

Time: Sunday, August 31, 17:00-18:00

Monday, September 1st

Training Neural Networks at Any Scale

Volkan Cevher

Ecole Polytechnique Fédérale de Lausanne (EPFL)

Abstract: At the heart of deep learning's transformative impact lies the concept of scale–encompassing both data and computational resources, as well as their interaction with neural network architectures. Scale, however, presents critical challenges, such as increased instability during training and prohibitively expensive model-specific tuning. Given the substantial resources required to train such models, formulating high-confidence scaling hypotheses backed by rigorous theoretical research has become paramount.

To bridge theory and practice, the talk explores a key mathematical ingredient of scaling in tandem with scaling theory: the numerical solution algorithms commonly employed in deep learning, spanning domains from vision to language models. We unify these algorithms under a common master template, making their foundational principles transparent. In doing so, we reveal the interplay between adaptation to smoothness structures via online learning and the exploitation of optimization geometry through non-Euclidean norms. Our exposition moves beyond simply building larger models–it emphasizes strategic scaling, offering insights that promise to advance the field while economizing on resources.

Speaker Bio: *Volkan Cevher is an Associate Professor at the Swiss Federal Institute of Technology Lausanne (EPFL) and an Amazon Scholar. He earned his B.Sc. in Electrical Engineering as valedictorian from Bilkent University in 1999 and completed his Ph.D. at the Georgia Institute of Technology in 2005. Before joining EPFL, he held research positions at the University of Maryland and Rice University. His research focuses on machine learning, optimization, signal processing, and information theory. He has been recognized with several prestigious awards, including being named an IEEE Fellow in 2024, receiving the ICML AdvML Best Paper Award in 2023, and winning the Google Faculty Research Award in 2018. Additionally, he was awarded an ERC Consolidator Grant in 2016 and an ERC Starting Grant in 2011. His recent publications explore topics such as stochastic optimization, federated learning, and adversarial robustness, with multiple papers featured in leading AI and machine learning conferences.*

Time: Monday, September 1, 11:00-12:00

When computers look at art: Recent triumphs and future opportunities for computer-assisted connoisseurship of fine art paintings and drawings

David G. Stork

Stanford University

Abstract: Our cultural patrimony of fine art paintings and drawings comprise some of the most important, memorable, and consequential images ever created, and present numerous problems in art history and the interpretation of "authored" stylized images. While sophisticated imaging (by numerous methods) has long been a mainstay in museum curation and conservation, it is only in the past few years that true image analysis—powered by computer vision, machine learning, and artificial intelligence—have been applied to fine art images. Fine art paintings differ in numerous ways from the traditional photographs, videos, and medical images that have commanded the attention of most experts up to now: such paintings vary extensively in style, content, non-realistic conventions, and especially intended meaning.

Rigorous computer methods have outperformed even seasoned connoisseurs on several tasks in the image understanding of art, and have provided new insights and settled deep disputes in art history. Additionally, the classes of problems in art analysis, particularly those centered on inferring meaning from images, are forcing computer experts to develop new algorithms and concepts in artificial intelligence.

This talk, profusely illustrated with fine art images and computer analyses, argues for the new discipline of computer-assisted connoisseurship, a merger of humanist and scientific approaches to image understanding. Such work will continue to be embraced by art scholars, and addresses new grand challenges in artificial intelligence.

Speaker Bio: *David G. Stork, PhD is Adjunct Professor at Stanford University and a graduate in Physics from MIT and the University of Maryland; he also studied Art History at Wellesley College. He has held faculty positions in Physics, Mathematics, Computer Science, Statistics, Electrical Engineering, Neuroscience, Psychology, Computational Mathematical Engineering, Symbolic Systems, and Art and Art History variously at Wellesley and Swarthmore Colleges, Clark, Boston, and Stanford Universities, and the Technical University of Vienna. He is a Fellow of seven international societies and has published eight books, 220+ scholarly articles, and 64 US patents. His Pixels & paintings: Foundations of computer-assisted connoisseurship (Wiley) appeared this year and he is completing Principled art authentication: A probabilistic foundation for representing and reasoning under uncertainty.*

Time: Monday, September 1, 8:30-9:00

Tuesday, September 2nd

Digital Cousins: Generative Multi-Environment Mixed Q-Learning

Urbashi Mitra

University of Southern California

Abstract: We propose a strategy for generating trajectories for policy optimization on graphs. While many systems are well modeled by Markov Decision Processes (MDPs), this approach induces a large state space which challenges policy optimization. We propose a novel on-line/in-real-time Q-learning methodology based on the creation of synthetic MDPs (digital cousins) that run in parallel with the true system. These cousins are statistically related, but distinct from the true system. The approach enables the ensemble learning of multiple policies which can be efficiently fused. The new learning method is distinctly different from more classical learning strategies that mix off-line collected data with real-time trajectory tracking. The proposed mixed strategy offers significantly improved convergence rates and performance. We provide theoretical results on convergence as well as the ranking of the informativeness of the synthetic environments via learning analyses based on coverage. We provide preliminary results on a multi-agent version of the learning approach. Numerical examples from wireless communication networks and multi-agent UAV networks are provided.

Speaker Bio: *Urbashi Mitra is the Gordon S. Marshall Chair in Engineering at the University of Southern California, with previous academic roles at Ohio State University and Bellcore. She holds B.S. and M.S. degrees from the University of California, Berkeley, and a Ph.D. from Princeton University. Dr. Mitra has made significant contributions to IEEE, serving as the inaugural editor-in-chief for IEEE Transactions on Molecular, Biological and Multi-Scale Communications, a Distinguished Lecturer for IEEE Communication and Signal Processing Societies, and in leadership roles including chairing the ComSoc Communication Theory Technical Committee, the SPS Signal Processing for Communications and Networks Committee, and the Transactions on Wireless Communications Steering Committee. She is an IEEE Fellow and has received numerous prestigious awards, including the ComSoc Women in Communications Engineering Technical Achievement Award, U.S. Fulbright Scholar and UK Royal Academy of Engineering Distinguished Visiting Professorship distinctions, a USC Viterbi School of Engineering Senior Research Award and the NSF CAREER Award.*

Time: Tuesday, September 2, 11.00-12.00

Wednesday, September 3rd

Training machines to decode electromyography signals for high bandwidth human-computer interfaces that work across people

Alexandre Gramfort

Meta

Abstract: Brain computer interfaces (BCIs) have been imagined for decades to solve the interface problem by allowing for input to computing devices at the speed of thought. However high-bandwidth communication has only been demonstrated using invasive BCIs with interaction models designed for single individuals, an approach that cannot scale to the general public. In this talk, I will describe the recent development of a noninvasive neuromotor interface that allows for computer input using surface electromyography (sEMG). I will give examples where by training machine learning models on thousands of participants, it is possible to develop generic sEMG neural network decoding models that work across many people without the need for per-person calibration, hence offering the first high-bandwidth neuromotor interface that directly leverages biosignals with performant out-of-the-box generalization across people.

Speaker Bio: *Alexandre Gramfort is a Senior Research Scientist at Meta Reality Labs in Paris, specializing in machine learning for building neuromotor interfaces using surface EMG signals. Previously, he was a Research Director at Inria, leading the MIND Team, and an Assistant Professor at Telecom Paris. His work spans machine learning, signal processing, and neuroscience applications. He is well known for his open-source contributions such as the scikit-learn software he co-created in 2010. He has received prestigious grants, including an ERC Starting Grant for SLAB in 2015 and an ANR Chaire on AI for BrAIN in 2019. He has also taught optimization, machine learning and neuroimaging courses at Institut Polytechnique de Paris and Université de Paris since 2015. His recent research focuses on generic neuromotor interfaces, domain adaptation, and electrophysiological data analysis.*

Time: Wednesday, September 3, 11.00-12.00

Invited Talk (Brain Decoding Special Session)

Brain decoding with deep learning: from cognitive tasks to foundation models

Hubert Banville

Meta

Abstract: Brain decoding aims at reconstructing relevant information, such as externally presented stimuli or endogenous variables, from brain activity. This modelling framework relies heavily on machine learning but has to deal with multiple challenges that are specific to brain activity time series such as limited SNR, non-stationarity and intersubject variability. Over the last few years, deep learning has emerged as a flexible and effective approach for tackling many of these challenges. In this talk, I will focus on two representative examples that showcase how deep learning can be used for brain decoding. The first is the decoding of cognitive processes, such as vision, which can be accomplished through custom contrastive learning pipelines, and scaled up across different brain devices, such as EEG, MEG and fMRI. The second is the use of self-supervised learning to learn from unlabelled brain data, which is now paving the way to developing brain foundation models that facilitate generalization across tasks, individuals and hardware.

Speaker Bio: *Hubert Banville is a Research Scientist in the Brain & AI group at Meta FAIR. His research focuses on machine learning for the decoding and processing of functional neuroimaging data. Hubert received his PhD in the Parietal team at Inria, Université Paris-Saclay, where he worked on self-supervised learning for EEG. Previously, he worked on mobile EEG as a researcher at InteraXon (maker of the Muse headband).*

Time: Monday, September 1, 13.30-14.00

Geometric and Topological Representation Learning

Semih Cantürk (Udem & Mila)
Hamed Shirzad (UBC)
Qi Yan (UBC)
Guy Wolf (Udem & Mila)
Renjie Liao (UBC & Vector Institute)
Danica J. Sutherland (UBC & Amii)

Abstract: Real-world data in natural and social sciences typically exhibit intricate and complex relationships that are well-suited to be represented as graphs, point clouds and time series among other geometric and topological structures. Embedding appropriate inductive biases into deep learning models is thus essential in building systems that can learn and generalize from such data. Machine learning on graphs in particular has seen rapid development in recent years, owing much to advances in graph representation learning (GRL), a large family of methods with close connections to signal processing designed to encode sparse graph structured data into dense vector form in graph representations. Thanks to their ability to leverage data-intrinsic geometries, graph neural networks (GNN) have been in the forefront of GRL, while later work have built upon this foundation to arrive at a wide selection of complex and powerful GNN architectures addressing expressivity, multi-resolution signals, or implicit symmetries. These developments have collectively facilitated the use of GNNs in a variety of applications ranging from recommender systems and traffic forecasting to biochemistry and materials science, while also spawning novel subfields that extend these learning paradigms to even more complex structures in temporal graphs or simplicial complexes. In this tutorial, we aim to provide a bottom-up view of modern graph representation learning and its extensions to related topological structures. Our tutorial aims to appeal to a large audience including both newcomers into the field of geometric representation learning as well as research and industry experts.

Time: Sunday, August 31, 9.00-12.00

Learning with Covariance Matrices: Foundations and Applications to Network Neuroscience

Saurabh Sihag (University at Albany SUNY)
Gonzalo Mateos (University of Rochester)
Elvin Isufi (Delft University of Technology)
Alejandro Ribeiro (University of Pennsylvania)

Abstract: This tutorial will cover the wide gamut of traditional PCA approaches to coVariance neural networks in a unifying manner. Through rigorous formulations and intuitive reasoning, the content will be made accessible to SP researchers familiar with the basics of statistical analysis and machine learning (ML). The theoretical core of the tutorial consists of two key modules that focus on the stability and transferability of VNNs. Broadly, these modules address the robust generalization properties of VNN models to heterogeneous scenarios encountered in practice. We will ground the theoretical advances behind VNNs in first principles of statistical inference. In addition to its didactic value, this approach offers an enlightening perspective to the traditional PCA-driven statistcal approaches, from the lens of GNNs. Further, this tutorial will also include an application module discussing the problem of brain age prediction in neurodegenerative conditions. The conceptual clarity and explainable solution to this problem elucidated by VNN models will be highlighted. Overall, tutorial contents will span a broad spectrum of theoretical and use-inspired contributions that are relevant to the SP community.

Time: Sunday, August 31, 13.30-15.00

Integration of Physics-Based and Data-Driven Models for Parameter Estimation with Applications to Image and Speech Signal Processing

Jie Chen (Northwestern Polytechnical University)
Xiuheng Wang (CRAN, CNRS, Universite de Lorraine)
Ziye Yang (Northwestern Polytechnical University)

Abstract: In the era of rapidly expanding data and computational power, data-driven models have gained tremendous momentum for tackling complex parameter estimation problems. However, purely data-driven approaches often face challenges such as low interpretability, risk of overfitting, and limited generalization when real-world data are scarce or unrepresentative. At the same time, physics-based methods provide transparent theoretical grounding and interpretability but may underperform when the physical environment is unknown, highly complex, or differs significantly from assumed models. Bridging these two complementary paradigms has therefore emerged as a crucial research direction in the signal processing community. The motivation behind such hybrid or integrated approaches is to leverage both domain knowledge (via physics-based constraints) and data-driven learning (via deep learning tools), resulting in systems that are more robust, explainable, and capable of capturing complex real-world phenomena. This tutorial is timely for both academic and industry stakeholders seeking to move beyond either purely model-driven or purely data-driven approaches. By understanding how to embed physical insights into deep learning architectures, or how to supplement traditional physics-based solutions with data-driven modules, researchers and engineers can develop models with improved performance, enhanced interpretability, and better generalization capabilities. As such, this topic has profound implications for a variety of fields, encompassing, but not limited to, computational imaging, remote sensing, or speech processing. Ultimately, this tutorial will offer a comprehensive roadmap for researchers to leverage the synergy between physics-based and data-driven approaches, which have emerged as the forefront of parameter estimation technologies in signal processing.

Time: Sunday, August 31, 15.30-17.00

Automatic Assessment of Atypical Speech (AAAS)

Mikko Kurimo (Aalto University)
Tamás Grósz (Aalto University)
Giampiero Salvi (NTNU)
Sofia Strömbergsson (Karolinska Institutet)
Sari Ylinen (Tampere University)
Minna Lehtonen (University of Turku)
Torbjørn Svendsen (NTNU)

Abstract: Automatic Assessment of Atypical Speech (AAAS) explores assessment of pronunciation and speaking skills of children, language learners, and speakers with speech sound disorders and methods to provide automatic rating and feedback using ASR and LLMs. Automatic speaking assessment (ASA) is a key technology for developing AI tools to self-practise second and foreign language skills and provide more complex feedback about fluency, vocabulary and grammar of the recorded speech. ASA is also very relevant for the detection and quantification of speech disorders and for developing speech exercises that can be performed independently at home.

Website: *https://teflon.aalto.fi/mlsp-aaas-2025/*

Large Vision Language Models (LVLMs) and their Application to Document Understanding

Sherif Mohamed (SDAIA)
Ahmed Masry (York University)
Enamul Hoque Prince (York University)
Parisa Kordjamshidi (Michigan State University)

Abstract: Document Understanding (DU) in Arabic presents significant challenges due to its linguistic complexity, diverse script structures, and the demands of long-context processing. While Large Vision-Language Models (LVLMs) perform well in short-context DU tasks in English, their effectiveness declines when handling Arabic documents, especially in long-context scenarios. This special session will explore innovative approaches to improving LVLM performance for Arabic, with broader implications for multilingual and long-context DU.

Website: *https://www. documentsunderstanding.com*

LEAP: Low-Energy AI For Edge Learning and Processing

Roberto Pereira (CTTC/CERCA, Department of Sustainable AI, Barcelona, Spain)
Paolo Dini (CTTC/CERCA, Department of Sustainable AI, Barcelona, Spain)

Abstract: This special session focuses on sustainable and distributed approaches to address the escalating energy demands of centralized ML solutions. It seeks innovative ML solutions that enable efficient, scalable, and sustainable on-device training/inference of traditional and new ML approaches. We encourage submissions on topics such as energy-aware algorithms, in-memory computing hardware, communication, and software brain-inspired models, aiming to highlight energy-efficient solutions that bridge the gap between state-of-the-art ML techniques and their deployment in resource-constrained settings.

Website: *https://leap2025.github.io/mlsp/*

Applications of AI in the Analysis of Cultural and Artistic Heritage

Sinem Aslan (University of Milan, Department of Historical Studies, Milan, Italy)
Hazım Kemal Ekenel (Istanbul Technical University, Department of Computer Engineering, Istanbul, Turkey)
Gennaro Vessio (University of Bari Aldo Moro, Department of Computer Science, Bari, Italy)
Hassan Ugail (University of Bradford, School of Informatics, Bradford, UK)
Anthony Bourached (University College London, Department of Neurology, London, UK)
Gattiglia Gabriele (University of Pisa, Department of Civilization and Forms of Knowledge, Pisa, Italy)

Abstract: Artificial Intelligence (AI) is transforming the study of cultural and artistic heritage by enabling advanced analysis, classification, and restoration of historical artifacts. This special session will showcase the latest AI-driven methodologies for analyzing, understanding, and enhancing historical and artistic materials, with a particular focus on machine learning techniques applied to textual, visual, and multimodal data. By bringing together experts from AI, computer vision, and digital humanities, it aims to foster interdisciplinary collaboration and highlight innovative approaches to preserving and understanding humanity's artistic and cultural legacy.

Website: *https://ai-cah2025.github.io/main/*

Sign Language Translation in the era of Large Language Model - Beyond English

Yazeed Alharbi (SDAIA)
Ahmed Ali (SDAIA)
Marek Hruz (University of West Bohemia)
Lale Akarun (Bogazici University)
Ivan Gruber (University of West Bohemia)
Ali Al Hejab (SDAIA)

Abstract: This special session addresses sign language translation challenges at the intersection of AI and accessibility, introducing a novel dataset co-developed with sign language users and interpreters. The session will provide a setup to discuss the generalization capabilities of sign language translation models, addressing a fundamental limitation in the field.

Website: *https://signforall.github.io/challenge/*

Decoding the Brain Time Series

Bruno Aristimunha (Université Paris-Saclay)
Florian Yger (LITIS, INSA-Rouen Normandy)
Marie-Constance Corsi (ICM, Inria NERV, INSERM, Paris-Sorbonne Université)
Sylvain Chevallier (Université Paris-Saclay, Inria)

Abstract: Over the past decade, machine learning has revolutionized many areas, yet its application to time-series data like EEG remains slow and under exploration. This session will discuss how this dual challenge from EEG Decoding calls for clinical neuroscience expertise and machine-learning skills to handle complex signals and how we could explore emerging models that may offer promising solutions.

Website: *https://mlsp2025-decoding-brain.github.io/*

BODYinTRANSIT

Mohammad Mahdi Dehshibi (Universidad Carlos III de Madrid)
Tomás Martínez Cortés (Universidad Carlos III de Madrid, Spain)
Fernando Díaz-de-María (Universidad Carlos III de Madrid, Spain)
Nadia Bianchi-Berthouze (University College London)
Ana Tajadura-Jiménez (Universidad Carlos III de Madrid)

Abstract: The BODYinTRANSIT Data Competition is part of the ERC-funded BODYinTRANSIT project and is hosted at the IEEE Machine Learning for Signal Processing (MLSP) Workshop 2025. This competition is dedicated to the decoding of human body perception through multimodal biosignals, thereby challenging participants to develop classification models that accurately predict perceived changes in body weight (lighter, heavier, or unchanged) based on physiological and kinematic time-series data. By participating in this competition, researchers will contribute significantly to the advancement of signal processing methodologies pertinent to biosignal analysis and will also acquire invaluable insights concerning human sensorimotor integration.

Website: *https://bodyintransit.eu/bit-data-competition/*

Non-native Children's Automatic Speech Assessment Challenge (NOCASA)

Mikko Kurimo (Aalto University)
Giampiero Salvi (NTNU)
Tamás Grósz (Aalto University)
Sari Ylinen (Tampere University)
Minna Lehtonen (University of Turku)
Sofia Strömbergsson (Karolinska Institutet)
Torbjørn Svendsen (NTNU)

Abstract: Learning the pronunciation of foreign or second language (L2) requires a lot of practise and accurate feedback. Mobile apps that have automatic pronunciation assessment (APA) technology lets learners practise pronunciation at their own time, place and pace. Challenges: The developing and implementing APA has several challenges. First and worst of all is the lack of speech data for L2 learners that would be annotated for pronunciation accuracy. This is particularly the case of children and the learners of low-resource target languages. Second, if such data were available, it is usually heavily unbalanced for different skill levels and the provided reference scores suffer from noise and inter-annotator disagreement. Finally, to make a useful app, the scoring has to happen in seconds to provide real-time feedback with minimal delay to encourage a lot of repetitions.

Data: Recordings of second language learning children of 5 - 12 years repeating the words in Norwegian that were played to them. For each word in the data we provide the correct orthographic transcription and the speech accuracy assessment score of 1 - 5 given by human experts.

Task: Develop an automatic speech assessment system and use it to predict the score of each utterance in the given test data.

Website: *https://teflon.aalto.fi/nocasa-2025/*

Sampling-Assisted Pathloss Radio Map Prediction

Çagkan Yapar
Stefanos Bakirtzis
Andra Lutu
Ian Wassell
Jie Zhang
Giuseppe Caire

Abstract: The Sampling-Assisted Pathloss Radio Map Prediction Data Competition at MLSP 2025 invites participants to develop deep learning models for predicting indoor pathloss radio maps using indoor geometry (floor plans), electromagnetic properties of building materials (reflectance and transmittance), and transmitter locations. The challenge includes two tasks that integrate these inputs with sparse pathloss samples: (1) predicting radio maps augmented by uniformly sampled ground-truth measurements; and (2) exploring sampling strategies for radio map estimation, where participants design approaches for selecting measurement locations. This challenge focuses on advancing sample-aided data-driven models for radio map prediction using a ray-tracing generated dataset that simulates various indoor propagation scenarios, building on previous challenges while emphasizing the role of sparse spatial samples in improving prediction accuracy

Website: *https://sapradiomapchallenge.github.io/*

VEELA - Vessel Extraction and Extrication for Liver Analysis

M. Alper Selver
Oğuz Dicle
N. Sinem Gezer
İlker Özgür Koska
Hazım Kemal Ekenel
Ilkay Oksuz
Ziya Ata Yazıcı
Pierre-Henri Conze
Tugce Toprak Tepegoz
Emre Kavur
Pervin Bulucu

Abstract: The VEELA challenge aims to initiate the development of advanced hepatic and portal vessel segmentation techniques from computed tomography angiography (CTA) images of healthy people (i.e., living donated liver transplantation candidates) and the design of new algorithms that can work under varying image quality and contrast levels.

The VEELA challenge is being organized as a successor to the CHAOS challenge (chaos.grand-challenge.org/) VEELA deepens the subject as it moves from solid organ segmentation to inner vascular tree extraction. To increase the connection between CHAOS and VEELA, the VEELA training and test datasets are chosen to be identical to the CHAOS training and test datasets.

Website: *https://chaos.grand-challenge.org/*

Industry Panel

Join us for a panel where we will hear perspectives of industrial researchers.

Moderator: Ceyhun B. Akgul

Bio: Ceyhun Burak Akgül completed his PhD from Télécom Paris Signals-Images Dept. and Boğaziçi University EE Dept. in 2007. During his PhD studies, he developed state-of-the-art digital shape description, similarity learning and intelligent visual search algorithms for content-based 3D object retrieval, published in top journals such as PAMI and IJCV. In 2014, he co-founded Vispera, an image recognition and data analytics startup serving the retail sector, where he currently undertakes the Co-CEO role. Before founding Vispera, Ceyhun was R&D Director at Vistek ISRA Vision (Istanbul, Turkey) from 2012 to 2014. He planned, coordinated and contributed to the design and development of several computer vision-based industrial automation systems and was the principal investigator of many European-funded research projects. Parallel to his activities in the industry, Dr. Akgül is Adjunct Professor and Senior Research Associate at the EE Dept., Bogazici University and Visiting Faculty at the Digital Architectural Design Program, Istanbul Technical University. During 2008-2009, he was Marie Curie postdoctoral fellow at Philips Research Europe (Video Processing and Analysis Group). His research and technology interests are focused on computer vision and machine learning with applications in image recognition, content-based visual search and retrieval, digital architecture and urban analytics. He published six journal and 50+ conference papers as well as three patents in these domains. He has been awarded as Entrepreneur of the Year in Turkey in 2018 by Ernst and Young.

Panelists:
Aytül Erçil (Vispera Inc.)

Bio: Professor Dr. Aytül Erçil received her BSc in Electrical Engineering and Mathematics from Boğaziçi University in 1979, her MSc in Applied Mathematics from Brown University in 1980, and her PhD in 1983. After working at General Motors Research Laboratory for five years, she worked as a faculty member at Boğaziçi University between 1988 and 2001 and as the director of the BUPAM Machine Vision Laboratory, which she founded. Between 2001 and 2013, she worked as a faculty member and the director of the VPALAB Machine Vision Laboratory at Sabancı University, which she founded. Prof. Erçil, who has served as a researcher/project manager in various international projects (NATO, FP4, Eureka, NSF, FP6, Nedo, FP7), is the founding president of TÖTİAD - Turkish Association for Pattern Recognition and Image Analysis, and has served as a board member of the IAPR 'International Association of Pattern Recognition'. Vistek ISRA Vision Inc., founded by Prof. Erçil in 2006, was sold to the German company ISRA Vision, which is number one in Europe and third in the world in machine vision, in December 2013. Erçil's work has been deemed worthy of many national and international awards such as the 'International Success Award', the Eureka Success Story, the Endeavor entrepreneur, the 2010 technology award finalist, the Veuve Clicquot 'most influential woman entrepreneur of the year' award, the first prize in the Machinery and Accessories Production Technologies competition, the '2013 Turkey's woman entrepreneur', the 'Kristal Ağaç woman entrepreneur of the year', the 2014 Ansiad 'woman entrepreneur of the year', the 'Microsoft Woman Leader Making a Difference in Informatics' award, the 'I-COM Data Startup Challenge' award, the 'Hello Tomorrow Top 500 Startups in Deeptech' award, the 2019 Selçuk Yasar entrepreneurship, innovation, innovation award, the 'EY Startup of the Year Award' IWEC Foundation 2020 Business award, the META Women in Tech award, the IWF 'Women who make a difference' award. She has also been included in Forbes' '50 most powerful women' list for four consecutive years.

Prof. Erçil serves on the advisory board of the Swiss Innovation Valley and the Scientific and Industrial Advisory Board of the European Machine Vision Association. A serial entrepreneur and certified angel investor, Prof. Erçil is a partner and co-CEO of Vispera Information Technologies Inc.

Prof. Berk Gökberk (Bogazici University)

Bio: Berk Gökberk graduated from the Department of Computer Engineering, Boğaziçi University, Turkey, in 1999. He obtained his MS and PhD degrees from the same department in 2001 and 2006. He focused on 2D and 3D face recognition systems during his graduate study. From 2006 until 2008, he was a senior scientist at the Information Systems and Security department, Philips Research Eindhoven, where he concentrated on computer vision systems and biometrics, especially

fingerprint biometrics, biometric template protection, and 3D face recognition systems. From 2008 until 2013, he was with the Signals of Systems group in the Department of Electrical Engineering, Mathematics and Computer Science, University of Twente. From 2014 until 2021, he worked as an Assistant Professor in the Computer Engineering Department at MEF University. Currently, he is a faculty member in the Department of Computer Engineering at Boğaziçi University. Berk Gökberk's research areas include 2D and 3D computer vision systems, biometric systems, the visual analysis of humans, deep learning, machine learning, data analysis, and data visualization.

Prof. Levent Arslan (Sestek)

Bio: Levent Arslan graduated from Bogazici University Electrical and Electronics Engineering department in 1991. Then he received MS and PhD degrees from Duke University Electrical Engineering department in 1993 and 1996. After graduation he worked at Entropic Research, Washington DC as an R&D engineer until 1998. Between 1998 and 2023 he worked at Bogazici University as a full-time professor. He also started a speech R&D company, Sestek, in 2000. Sestek now has 170 employees, mostly R&D engineers. Sestek offers a wide range of products including conversational AI and Analytics. Prof. Arslan has 21 journal papers, 76 conference papers and 22 patents. His research interests are speech recognition, speech synthesis, voice verification and natural language understanding.

Dr. Erşen Kavak (Genomize & Boğaziçi University)

Bio: Dr. Ersen Kavak is an entrepreneur of genomics and a software enthusiast. He is the founder of Genomize Inc. and an adjunct faculty member at Bogazici University. He completed his Ph.D. in Molecular Biology and Genetics at Bogazici University in 2007 and worked at the Ludwig. Institute for Cancer Research, Karolinska Institute, as a Postdoctoral Researcher after that. He published multiple papers on genomic regulation in cancer cells in prestigious journals such as Nature and Nucleic Acid Research. After his time in Karolinska, he founded Genomize, Inc. in 2013 to create a solution that would allow physicians to diagnose patients with rare diseases quickly and reliably. So far, his vision helped physicians to diagnose more than 240.000 patients in more than 25 countries. He also has been teaching Python at Bogazici University for molecular biology students since 2014 and coaching next-generation bioinformaticians.

Time: Wednesday, September 3, 13:30-15:00

Industrial-Academic Joint Workshop on Emerging Problems and Methods in Audio, Speech and Language Processing

Agenda:

Talks (16:00-17:10)

Each talk: 11 minutes presentation + 3 minutes Q&A

1. Mengyao Zhu (Huawei, China): Challenges and Requirements in the field of Audio from Huawei
2. Zheng-Hua Tan (Aalborg University, Denmark): Emerging Sequence Models for Audio Representation Learning and Speech Enhancement
3. Jinhua Liang (Queen Mary University of London, UK):
4. Wenwu Wang (University of Surrey, UK): Text-Queried Audio Source Separation
5. Cem Subakan (Laval University/Mila-Quebec AI Institute, Canada): Producing Listenable Explanations for Audio Models

Panel Discussion (17:10-18:00)

Panel Members:

- Zheng-Hua Tan, Aalborg University, Denmark
- Paris Smaragdis, MIT, USA
- Cem Subakan, Laval University/Mila-Quebec AI Institute, Canada
- Mengyao Zhu, Huawei, China
- Wenwu Wang, University of Surrey, UK

Time: Monday, September 1, 16:00-18:00, Levent 3 Room

Oral Sessions

★: Best paper award nominee

Oral Session 1: Signal Decomposition and Estimation

Session Chairs: Danilo Comminiello and Murat Saraclar

Time: Monday, September 1, 9:00-10:30

Continuous-Time Signal Decomposition: An Implicit Neural Generalization Of Pca And Ica

Shayan Kevin Azmoodeh, Paris Smaragdis, Krishna Subramani

University of Illinois at Urbana-Champaign, University of Illinois, Urbana Champaign, University of Illinois at Urbana-Champaign

Learning Rate Should Scale Inversely With High-Order Data Moments In High-Dimensional Online Independent Component Analysis

M. Oguzhan Gultekin, Samet Demir, Zafer Dogan

Koç University, Koc University, Koc University

Lanm: Learned Atomic Norm Minimization For Superfast Gridless Spectral Compressed Sensing

Zai Yang, Zhuoli Zhang, Wenlong Wang, Weichao Zheng, Yan Yang, Zhiqiang Wei

Xi'an Jiaotong University, Xi'an Jiaotong University, Xi'an Jiaotong University

Prnet: Efficient And Robust Phase Retrieval Via Stochastic Refinement

Mehmet Onurcan Kaya, Figen S. Oktem

Technical University of Denmark, Middle East Technical University

★Coordinate Ascent Neural Kalman-Mle For State Estimation

Bettina Hanlon, Ángel F. García-Fernández

University of Liverpool, Universidad Politécnica de Madrid

Oral Session 2: Audio, Speech, and Music Processing

Session Chairs: Wenwu Wang and Mark Hasegawa-Johnson

Time: Monday, September 1, 14:00-15:30

Comparison Of End-To-End Speech Assessment Models For The Nocasa 2025 Challenge

Aleksei Žavoronkov, Tanel Alumäe

Tallinn University of Technology

Audio Prototypical Network For Controllable Music Recommendation

Fırat Öncel, Emiliano Penaloza, Haolun Wu, Shubham Gupta, Mirco Ravanelli, Laurent Charlin, Cem Subakan

Concordia University/Mila, University of Montreal/Mila, McGill University/Mila, Laval University/Mila, Concordia University/Mila, HEC Montreal/Mila, Laval University/Mila

★Re-Bottleneck: Latent Re-Structuring For Neural Audio Autoencoders
Dimitrios Bralios, Jonah Casebeer, Paris Smaragdis
UIUC, Adobe Systems, MIT

Ddl: A Dataset For Drone Detection And Localization From Multi-Channel Audio And A Deep Uncertainty-Aware Framework
Saeid Safavi, Özkan Çaylı, Muhammad Amin Safavi, Ben Cook, Wenwu Wang
University of Surrey

Input Conditioned Layer Dropping In Speech Foundation Models
Abdul Hannan, Daniele Falavigna, Alessio Brutti
University of Trento, Fondazione Bruno Kessler, Fondazione Bruno Kessler

Oral Session 3: Learning Algorithms and Optimization

Session Chairs: Zafer Doğan and Selin Aviyente

Time: Tuesday, September 2, 9:00-10:30

Improving Communication-Efficiency For Decentralized Federated Clustering
Mirko Nardi, Lorenzo Valerio
Consiglio Nazionale delle Ricerche, National Research Council of Italy

Fast And Robust Training Of Deep Learning Models With Multiplicative Adagrad
Manos Kirtas, Nikolaos Passalis, Anastasios Tefas
Aristotle University of Thessaloniki, Aristotle University of Thessaloniki, Aristotle University of Thessaloniki

Information Entropy-Based Scheduling For Communication-Efficient Decentralized Learning
Jaiprakash Nagar, Zheng Chen, Marios Kountouris, Photios A. Stavrou
Eurecom, Linköping University, Universidad de Granada, Eurecom

Model Recycling Framework For Multi-Source Data-Free Supervised Transfer Learning
Sijia Wang, Ricardo Henao
Duke University, Duke University

★Meta-Tree: Bayesian Approach To Avoid Overfitting In Decision Trees And Analysis On The Application To Boosting
Naoki Ichijo, Toshiyasu Matsushima
Waseda University, Waseda University

Oral Session 4: Computer Vision

Session Chairs: Ceyhun B. Akgül and Sinem Arslan

Time: Tuesday, September 2, 14:00-15:30

Trust The Model: Compact Vlms As In-Context Judges For Image-Text Data Quality

Daulet Toibazar, Kesen Wang, Mohamed Sayed, Sherif Mohamed, Pedro J Moreno Mengibar

Humain AI, Humain, University of Oulu, thefutureai, Carnegie Mellon University

Solving Jigsaw Puzzles In The Wild: Human-Guided Reconstruction Of Cultural Heritage Fragments

Omidreza Safaei, Sinem Aslan, Sebastiano Vascon, Luca Palmieri, Marina Khoroshiltseva, Marcello Pelillo

University of Venice, University of Milan, University of Venice, University of Venice, University Ca' Foscari of Venice, Ca' Foscari University of Venice

★Apa: Domain Generalization Using Frequency Based Augmentation

Sina Salehnia, Erchan Aptoula, Oznur Tastan

Sabanci University, Sabanci University, Microsoft Research

Ptychographic Image Reconstruction From Limited Data Via Score-Based Diffusion Models With Physics-Guidance

Refik Mert Cam, Junjing Deng, Rajkumar Kettimuthu, Mathew J. Cherukara, Tekin Bicer

University of Illinois at Urbana-Champaign, University of Chicago, University of Chicago

Radiotrace: Bridging Diffusion Priors And Rss Measurements For Accurate Radio Map Estimation

Liu Yang, Qiang Li, Zhuo Cao, Jingran Lin

University of Electronic Science and Technology of China, University of Electronic Science and Technology of China, University of Electronic Science and Technology of China, University of Electronic Science and Technology of China

Oral Session 5: ML for Health and Neuroscience

Session Chairs: Burak Acar and Devrim Ünay

Time: Wednesday, September 3, 9:00-10:30

Toward A Gaze-Independent Brain-Computer Interface Using The Code-Modulated Visual Evoked Potentials

Radovan Vodila, Juliette Claire van Lohuizen, Jordy Thielen

Radboud University, Donders Institute for Brain, Cognition and Behaviour

Closing The Gap In Multimodal Medical Representation Alignment

Eleonora Grassucci, Giordano Cicchetti, Danilo Comminiello

Sapienza University of Rome, University of Roma "La Sapienza", Sapienza University of Rome

★Cycle-Consistent Diffusion Model With Vessel-Aware Attention For Endoscopic Image Translation

Meryem Amaouche, Ouassim Karrakchou, Mounir Ghogho, Christian Daul, Anouar Elghazzaly, Mohamed Alami, Ahmed Ameur

International University of Rabat, International University of Rabat, University Mohammed VI Polytechnic

Rsr-Nf: Neural Field Regularization By Static Restoration Priors For Computed Dynamic Imaging

Berk Iskender, Sushan Nakarmi, Nitin Daphalapurkar, Marc Louis Klasky, Yoram Bresler

Analog Devices, Inc., Los Alamos National Laboratory, Los Alamos National Laboratory, Los Alamos National Laboratory, University of Illinois at Urbana-Champaign

Perturbation-Based Multiview Graph Learning With Consensus Graph

Mohammad Alwardat, Selin Aviyente

Michigan State University, Michigan State University

Poster Sessions

Note: *Affiliations are taken from openreview. If the author does not have a profile, or the profile is not upto-date there might be inaccuracies. You can see the posterboard assignments through the link here.*[1]

Monday Session

Session Chairs: Mirco Ravanelli and Zafer Doğan

Signal Decomposition and Estimation Methods (Marmara Hall)

Continuous-Time Signal Decomposition: An Implicit Neural Generalization Of Pca And Ica

Shayan Kevin Azmoodeh, Paris Smaragdis, Krishna Subramani

University of Illinois at Urbana-Champaign, University of Illinois, Urbana Champaign, University of Illinois at Urbana-Champaign

Learning Rate Should Scale Inversely With High-Order Data Moments In High-Dimensional Online Independent Component Analysis

M. Oguzhan Gultekin, Samet Demir, Zafer Dogan

Koç University, Koc University, Koc University

Lanm: Learned Atomic Norm Minimization For Superfast Gridless Spectral Compressed Sensing

Zai Yang, Zhuoli Zhang, Wenlong Wang, Weichao Zheng, Yan Yang, Zhiqiang Wei

Xi'an Jiaotong University, Xi'an Jiaotong University, Xi'an Jiaotong University

Prnet: Efficient And Robust Phase Retrieval Via Stochastic Refinement

Mehmet Onurcan Kaya, Figen S. Oktem

Technical University of Denmark, Middle East Technical University

Coordinate Ascent Neural Kalman-Mle For State Estimation

Bettina Hanlon, Ángel F. García-Fernández

University of Liverpool, Universidad Politécnica de Madrid

Efficient Algorithms For The Hadamard Decomposition

Samuel Wertz, Nicolas Gillis, Arnaud Vandaele

UMons, University of Mons, University of Mons

Outlier-Resilient Model Fitting Via Percentile Losses: Methods For General And Convex Residuals

João Domingos, Joao Xavier

Instituto Superior Técnico, Instituto Superior Técnico

[1] https://docs.google.com/spreadsheets/d/1yqTMuGf85025r907P1a_kFypLq4HArs1HkKGq6tb0tQ/edit?usp=sharing

Efficient Algorithms For Estimating The Parameters Of Mixed Linear Regression Models

Babak Barazandeh, Ali Ghafelebashi, Meisam Razaviyayn
University of Southern California, University of Southern California, University of Southern California

Hankel Surrogate For Model-Bridge Simulation Calibration

Lincon Souza, Maha Mahyub, Bojan Batalo, Keisuke Yamazaki
AIST, National Institute of Advanced Industrial Science and Technology, AIST, National Institute of Advanced Industrial Science and Technology, AIST, National Institute of Advanced Industrial Science and Technology

Nonlinear Matrix Decomposition With The Sigmoid Function

Harrison Nguyen, Atharva Awari, Arnaud Vandaele, Nicolas Gillis
Umons, University of Mons, University of Mons, University of Mons

Tsnpc: Learning From Partially Observed Data Using Tensor Network Structured Probabilistic Circuits

Niccolo' Ciolli, Morten Mørup, Mikkel N. Schmidt
Technical University of Denmark, Technical University of Denmark, Technical University of Denmark

Online Frequency Estimation With Adaptive Locally Differentially Private Mechanisms

Sinan Yıldırım, Giray Düzel
Sabancı University, Sabanci University

NOCASA Data Challenge & Special Session: AAAS (Marmara Hall)

Non-Native Children'S Automatic Speech Assessment Challenge (NOCASA)

Yaroslav Getman, Tamás Grósz, Mikko Kurimo, Giampiero Salvi
Aalto University, Aalto University, Aalto University, Norwegian University of Science and Technology

Automated Pronunciation Scoring Of Child L2 Learners With Score Calibration For Imbalanced Distributions

Yuuki Tachioka
Denso IT Laboratory

Comparison Of End-To-End Speech Assessment Models For The Nocasa 2025 Challenge

Aleksei Žavoronkov, Tanel Alumäe
Tallinn University of Technology

Child speech assessment through large language model speech synthesis: Preliminary results

Xinwei Cao, Zijian Fan, Torbjørn Svendsen, Giampiero Salvi
Norwegian University of Science and Technology, Norwegian University of Science and Technology, Norwegian University of Science and Technology, KTH Royal Institute of Technology

LLMs and Deep Learning Architectures (Marmara Hall)

Convolutional Spiking-Based Gru Cell For Spatio-Temporal Data

Yesmine Abdennadher, Michele Rossi, Eleonora Cicciarella
University of Padua, University of Padua

Data Aware Differentiable Neural Architecture Search For Tiny Keyword Spotting Applications

Yujia Shi, Emil Njor, Sven Ewan Shepstone, Pablo Martínez-Nuevo, Xenofon Fafoutis
Technical University of Denmark, Harvard University, Bang & Olufsen, Bang & Olufsen, Technical University of Denmark

An Alternating Algorithm For Neural Collapse In Deep Classifier Neural Network With Arbitrary Number Of Classes

Rebero Musana, Thuan Nguyen, Thinh Nguyen
East Tennessee State University, Oregon State University

Neural-Anova: Analytical Model Decomposition Using Automatic Integration

Steffen Limmer, Clemens Otte, Steffen Udluft
Siemens Corporate Research, Siemens Corporate Research, Siemens Technology

Asymptotic Study Of In-Context Learning With Random Transformers Through Equivalent Models

Samet Demir, Zafer Dogan
Koc University, Koc University

Tackling Distribution Shift In Llm Via Kilo: Knowledge-Instructed Learning For Continual Adaptation

Iing muttakhiroh, Thomas Fevens
Concordia University, Concordia University

Post-Inference Guided Transformer For Anomaly Interval Localization In Multivariate Time Series

Göksu Uzuntürk, Tugba Taskaya Temizel
Middle East Technical University, Graduate School of Informatics

Semantic Chunking And Chain-Of-Thought Reasoning For Rag-Based Document Processing

Yiğit Ateş, İbrahim Umut Bozlar, Suayb S. Arslan, Alperen SAYAR, Seyit ERTUĞRUL
Tam Finans, Tam Finans, Bogazici University, Tam Finans Faktoring A.Ş, Tam Finans Faktoring A.Ş

Audio and Speech Processing (Dolmabahce Hall)

Ddl: A Dataset For Drone Detection And Localization From Multi-Channel Audio And A Deep Uncertainty-Aware Framework

Saeid Safavi, Özkan Çaylı, Muhammad Amin Safavi, Ben Cook, Wenwu Wang
University of Surrey, , University of Surrey

Audio Prototypical Network For Controllable Music Recommendation

Fırat Öncel, Emiliano Penaloza, Haolun Wu, Shubham Gupta, Mirco Ravanelli, Laurent Charlin, Cem Subakan
Concordia University, Montreal Institute for Learning Algorithms, University of Montreal, Université de Montréal, McGill University, Université Laval, Concordia University, HEC Montreal, Universite Laval, Université Laval

Re-Bottleneck: Latent Re-Structuring For Neural Audio Autoencoders

Dimitrios Bralios, Jonah Casebeer, Paris Smaragdis
Department of Computer Science, Adobe Systems, University of Illinois, Urbana Champaign

Input Conditioned Layer Dropping In Speech Foundation Models

Abdul Hannan, Daniele Falavigna, Alessio Brutti
University of Trento, Fondazione Bruno Kessler, Fondazione Bruno Kessler

Audiomae++: Learning Better Masked Audio Representations With Swiglu Ffns

Sarthak Yadav, Sergios Theodoridis, Zheng-Hua Tan
Aalborg University, Aalborg University, Aalborg University

Hubert-Derived Ssl Features And Ecapa-Tdnn Matching For Robust Audio Deep-Fake Detection

Gul Tahaoglu
Karadeniz Technical University

Efficient Representation Learning For Music Via Likelihood Factorisation Of A Variational Autoencoder

Ningzhi Wang, Daniel Stoller, Simon Dixon
Queen Mary University London , Spotify, Queen Mary University London

Semi-Supervised Audio-Visual Action Recognition With Audio Source Localization Guided Mixup

Seokun Kang, Taehwan Kim
StudioLab, Ulsan National Institute of Science and Technology

Sage: Spliced-Audio Generated Data For Enhancing Foundational Models In Low-Resource Arabic-English Code-Switched Speech Recognition

Muhammad Umar Farooq, Oscar Saz
Emotech Ltd. UK, Emotech Ltd

From Aesthetics To Human Preferences: Comparative Perspectives Of Evaluating Text-To-Music Systems

Huan Zhang, Jinhua Liang, Huy Phan, Wenwu Wang, Emmanouil Benetos
Queen Mary, University of London, Queen Mary University of London, Meta, University of Surrey, Queen Mary, University of London

Whisper Speaker Identification: Leveraging Pre-Trained Multilingual Transformers For Robust Speaker Embeddings

Jakaria Islam Emon, Md Abu Salek, Kazi Tamanna Alam
Hokkaido Denshikiki Co., Ltd.

Prototypical Contrastive Learning For Improved Few Shot Audio Classification

Christos Sgouropoulos, Christos Nikou, Stefanos Vlachos, Theiou Vasileios, Foukanelis Christos Georgios, Theodoros Giannakopoulos
NCSR Demokritos, National Centre For Scientific Research Demokritos, National Center of Scientific Research Demokritos, National Center for Scientific Research Demokritos, National Centre For Scientific Research Demokritos, National Centre For Scientific Research Demokritos

Tiny Noise-Robust Voice Activity Detector For Voice Assistants

Hamed Jafarzadeh Asl, Mahsa Ghazvini Nejad, Amin Edraki, Masoud Asgharian, Vahid Partovi Nia
Huawei Technologies Ltd., Huawei Technologies Ltd., Huawei Technologies Ltd., McGill University, Huawei Technologies Ltd.

Improving Phone Recognition Through Informed Initialization And Path-Aligned Ctc Loss

Zijian Fan, Xinwei Cao, Giampiero Salvi, Torbjørn Svendsen
Norwegian University of Science and Technology, Norwegian University of Science and Technology, Norwegian University of Science and Technology, Norwegian University of Science and Technology

An Analysis Of Associations Between Maternal Vocalizations And Infant Stress Recovery Using Speech Emotion Recognition Models

Alara Tin, Mark A. Hasegawa-Johnson
University of Illinois at Urbana-Champaign, University of Illinois, Urbana Champaign

Child Speech Assessment Through Large Language Model Speech Synthesis: Preliminary Results

Xinwei Cao, Zijian Fan, Torbjørn Svendsen, Giampiero Salvi
Norwegian University of Science and Technology, Norwegian University of Science and Technology, Norwegian University of Science and Technology, Norwegian University of Science and Technology

The Sampling-Assisted Pathloss Radio Map Prediction Challenge (Dolmabahce Hall)

Efficient Indoor Radio Map Prediction With Improved Transformers And Active Sampling Strategies

Zhihao Zheng, Yunzhou Li, Limin Xiao, Ming Zhao
Tsinghua University

Irm-Net: An Enhanced Attention Networks For Indoor Radio Map Estimation

Qi Chen, Jingjing Yang, Jingjing Yang, Haidong Tan, Boyuan Chen

Sparse-Guided Radiounet With Adaptive Sampling For The Mlsp 2025 Sampling-Assisted Pathloss Radio Map Prediction Data Competition

Ryoichi Kojima, Satoshi Ito, Tatsuya Nagao, Masato Taya
KDDI Corporation, KDDI Corporation

Radio Map Prediction Via Neural Networks With Ground Truth Shortcuts And Selective Sampling

Mengfan Wu, Marco Skocaj, Mate Boban
Technische Universität Berlin, Huawei Technologies Ltd., Huawei Technologies Ltd.

U-Net Based Indoor Radio Map Prediction Under Sparse Sampling

Tianxiang Xing, Leyi Zou, Tejas Bharadwaj, Rushabha Balaji, Danijela Cabric
University of California, Los Angeles, University of California, Los Angeles, University of California, Los Angeles

Saipp-Net: A Sampling-Assisted Indoor Pathloss Prediction Method For Wireless Communication Systems

Bin Feng, Meng Zheng, Wei Liang, Lei Zhang
Shenyang Institute of Automation, Chinese Academy of Sciences, , Shenyang Institute of Automation

U-Net For Indoor Pathloss Prediction From Sparse Measurements With Physics-Informed Features

Khoren Petrosyan, Hrant Khachatrian, Rafayel Mkrtchyan, Theofanis Raptis
Yerevan State University, Yerevan State University, Yerevan State University, National Research Council, Italy

The Sampling-Assisted Pathloss Radio Map Prediction Competition

Cagkan Yapar, Stefanos Sotirios Bakirtzis, Andra Lutu, Ian Wassell, Jie Zhang, Giuseppe Caire
Technische Universität Berlin, University of Cambridge, Telefonica Research, University of Cambridge, Technische Universität Berlin

Computer Vision Applications (Dolmabahce Hall)

Efficient License Plate Recognition Via Pseudo-Labeled Supervision With Grounding Dino And Yolov8

Zahra Ebrahimi Vargoorani, Ching Suen, Amir Mohammad Ghoreyshi
Concordia University, Concordia University

Pose-Guided Focal Loss For Enhancing Vision Transformers In Continuous Sign Language Recognition

Jingyan Wang, Dezong Zhao, yijia hao, Muhammad Ali Imran, Wasim Ahmad
University of Glasgow, University of Glasgow, University of Glasgow

Estimation Of Ndvi From Uav Rgb Imagery Using Deep Learning Models

Zhe NIU, Brian Mak

Deep Learning Based Polyculture Structural Phenotyping

Arif Yılmaz, Yavuzhan Erdem, H. Isil Bozma
Bogazici University, Bogazici University

3D Face Morph Generation Using Geometry-Aware Template Inversion

Hatef Otroshi Shahreza, Laurent Colbois, Sébastien Marcel
Idiap Research Institute, Idiap Research Institute, Université de Lausanne

Generating Synthetic Face Recognition Datasets Using Brownian Identity Diffusion And A Foundation Model

Hatef Otroshi Shahreza, Sébastien Marcel
Idiap Research Institute, Université de Lausanne

Post-Training Quantization For Vision Mamba With K-Scaled Quantization And Reparameterization

Bo-Yun Shi, Yi-Cheng Lo, An-Yeu Andy Wu, Yi-Min Tsai
National Taiwan University, National Taiwan University, National Taiwan University, National Taiwan University

Attention And Edge-Aware Band Selection For Efficient Hyperspectral Classification Of Burned Vegetation

Mahmad Isaq Karankot, Bradley M Whitaker, Xiaobing Zhou, Muhammad Masood
Montana State University - Bozeman, Montana State University - Bozeman

Bridging Discrete And Continuous: A Multimodal Strategy For Complex Emotion Detection

Jiehui Jia, Huan Zhang, Jinhua Liang
Queen Mary, University of London, Queen Mary, University of London, Queen Mary University of London

Mcff-Det: Multispectral Coarse-To-Fine Fusion For Object Detection

Xiaoguang Zhai, Fan Xu, Yaowen Pan
Nanjing University of Aeronautics and Astronautics, Nanjing University of Aeronautics and Astronautics, Nanjing University of Aeronautics and Astronautics

Efficient Mouth Alignment For Visual Speech Recognition

Zhe NIU, Brian Mak
The Hong Kong University of Science and Technology, Hong Kong University of Science and Technology

Long Range Constraints For Neural Texture Synthesis Using Sliced Wasserstein Loss

Liping Yin, Albert Chua
Michigan State University, Independent Researcher

Gems: Group Emotion Profiling Through Multimodal Situational Understanding

Anubhav Kataria, Surbhi Madan, Shreya Ghosh, Tom Gedeon, Abhinav Dhall
KroopAI, Indian Institute Of Technology–Ropar (IIT–Ropar), Curtin University, Curtin University of Technology, Monash University

Tuesday Session

Session Chairs: Cem Subakan and Murat Saraclar

Applications in Wireless, Radio and Radar Communications (Marmara Hall)

Few-Shot Radar Signal Recognition Through Self-Supervised Learning And Radio Frequency Domain Adaptation

Zi Huang, Simon Denman, Akila Pemasiri, Clinton Fookes, Terrence Martin
Queensland University of Technology, Queensland University of Technology, Queensland University of Technology, Queensland University of Technology

Signal Processing Challenges In Automotive Radar

Sandeep Rao, Rajan Narasimha, Shunqiao Sun
, The University of Alabama

Advancing Single-Snapshot Doa Estimation With Siamese Neural Networks For Sparse Linear Arrays

Ruxin Zheng, Shunqiao Sun, Hongshan Liu, Yimin Zhang
The University of Alabama, The University of Alabama, Indiana University,

Advancing High-Resolution And Efficient Automotive Radar Imaging Through Domain-Informed 1D Deep Learning

Ruxin Zheng, Shunqiao Sun, Hongshan Liu, Holger Caesar, Honglei Chen, Jian Li
The University of Alabama, The University of Alabama, Indiana University, Delft University of Technology, MathWorks, University of Florida

Radiotrace: Bridging Diffusion Priors And Rss Measurements For Accurate Radio Map Estimation

Liu Yang, Qiang Li, Zhuo Cao, Jingran Lin
University of Electronic Science and Technology of China, University of Electronic Science and Technology of China, University of Electronic Science and Technology of China, University of Electronic Science and Technology of China

Robust Imputation Swinlstm For Spectrum Map Prediction Of Incomplete Data

Haikuo Xu, Jie Li, Qihui Wu, Youbiao Wu, Jieyu Gao
Nanjing University of Aeronautics and Astronautics, Nanjing University of Aeronautics and Astronautics, Nanjing University of Aeronautics and Astronautics, Nanjing University of Aeronautics and Astronautics

Online Gaussian Process For Dynamic Radio Map Updating

Yuanyuan Deng, Bo Zhou, Fanhua Li, Qihui Wu
Nanjing University of Aeronautics and Astronautics, Nanjing University of Aeronautics and Astronautics, Nanjing University of Aeronautics and Astronautics, Nanjing University of Aeronautics and Astronautics

Signal Prediction For Loss Mitigation In Tactile Internet: A Leader-Follower Game-Theoretic Approach

Mohammad Ali Vahedifar, Qi Zhang
Aarhus University, Aarhus University

Benchmarking Transfer Learning In Passive Sonar: An Evaluation Study

Felix Ingham, Timothy Hospedales
University of Edinburgh, University of Edinburgh, University of Edinburgh

Robust And Efficient Kernel-Based Digital Self-Interference Cancellation Using A Priori Knowledge In Full-Duplex Transceivers

M. Hossein Attar, Jochen Fink, Ramez Askar, Slawomir Stanczak
Technische Universität Berlin, Fraunhofer HHI

Special Session: Applications of AI in the Analysis of Cultural and Artistic Heritage (Marmara Hall)

Solving Jigsaw Puzzles In The Wild: Human-Guided Reconstruction Of Cultural Heritage Fragments

Omidreza Safaei, Sinem Aslan, Sebastiano Vascon, Luca Palmieri, Marina Khoroshiltseva, Marcello Pelillo
University of Venice, University of Milan, University of Venice, University of Venice, University Ca' Foscari of Venice, Ca' Foscari University of Venice

The Cow Of Rembrandt - Analyzing Artistic Prompt Interpretation In Text-To-Image Models

Alfio Ferrara, Sergio Picascia, Elisabetta Rocchetti
University of Milan, University of Milan, University of Milan

Speaking Images. A Novel Framework For The Automated Self-Description Of Artworks

Valentine Bernasconi, Gustavi Marfia
University of Bologna, University of Bologna

Experimenting Active And Sequential Learning In A Medieval Music Manuscript

Sachin Sharma, Federico Simonetta, Michele Flammini
Gran Sasso Science Institute, Gran Sasso Science Institute, Gran Sasso Science Institute

Deep Learning For Fine-Grained Classification Of Montelupo Majolica: Benchmarking And Explainability

Federica Mauro, Franco Cicirelli, Gabriele Gattiglia, Ettore Ritacco
University of Pisa, ICAR, University of Pisa, University of Udine

Dfa-Con: A Contrastive Learning Approach For Detecting Copyright Infringement In Deepfake Art

Haroon Wahab, Hassan Ugail, Irfan Mehmood
University of Bradford, University of Bradford, University of Bradford

Restoration And Enhancement Of Historical Manuscript Images Using Diffusion Model

Baran Işık, B. Ugur Töreyin
International Technological University, Istanbul Technical University

Multimodal Artwork Topic Modeling Via Fine-Tuned Clip And Knowledge-Driven Prompts

Raffaele Scaringi, Giovanni Stea, Nicola Fanelli, Gennaro Vessio, Giovanna Castellano
University of Bari, University of Bari, University of Bari, University of Bari, University of Bari Aldo Moro

LEAP: Low-Energy AI For Edge Learning and Processing (Marmara Hall)

Improving Communication-Efficiency For Decentralized Federated Clustering

Mirko Nardi, Lorenzo Valerio
Consiglio Nazionale delle Ricerche, National Research Council of Italy

Unseen Speaker And Language Adaptation For Lightweight Text-To-Speech With Adapters

Alessio Falai, Ziyao Zhang, Ákos Gángoly
Amazon, Amazon, Amazon

Utilizing Dynamic Sparsity On Pretrained Detr

Reza Sedghi, Anand Subramoney, David Kappel
Universität Bielefeld, Royal Holloway, University of London, Universität Bielefeld

Neural Successive Cancellation Decoder For Polar Codes Using Analog In-Memory Computing With Memristors

Muhammad Atif Ali, E. Uras Kargı, Tolga M Duman
Bilkent University, Bilkent University, Bilkent University

Self-Supervised Learning At The Edge: The Cost Of Labeling

Roberto Pereira, Fernanda Famá, Asal Rangrazi Asl, Marco Miozzo, Charalampos Kalalas, Paolo Dini
Centre Tecnologic de Telecomunicacions de Catalunya, Universidad Politécnica de Cataluna, Barcelona Supercomputing Center, Centre Tecnologic de Telecomunicacions de Catalunya, Centre Tecnologic de Telecomunicacions de Catalunya, CTTC/CERCA

Energy-Information Trade-Off In Self-Directed Channel Memristors

Waleed El-Geresy, Dániel Hajtó, György Cserey, Deniz Gunduz
Imperial College London, Pazmany Peter catholic University, Pazmany Peter Catholic University, Imperial College London

ML for Neuroscience (Dolmabahce Hall)

Latent Representation Learning For Multimodal Brain Activity Translation

Arman Afrasiyabi, Dhananjay Bhaskar, Erica Lindsey Busch, Laurent Caplette, Rahul Singh, Guillaume Lajoie, Nicholas Turk-Browne, Smita Krishnaswamy
Yale University, University of Wisconsin - Madison, Yale University, Yale University, Yale University, Mila - Quebec Artificial Intelligence Institute, Yale University, Yale University

Uniphynet: A Unified Network For Multimodal Physiological Raw Signal Classification

Renxiang Qiu, Raghavendra Selvan
University of Copenhagen, University of Copenhagen

Microwavenet: Lightweight Cbam-Augmented Wavelet-Attentive Networks For Robust Eeg Denoising

Jeet Bandhu Lahiri, Arvasu Kulkarni, Siddharth Panwar
Indian Institute of Technology Mandi, IIT Mandi, IIT Mandi

Towards Generalizable Learning Models For Eeg-Based Identification Of Pain Perception

Mathis Rezzouk, Fabrice Gagnon, Alyson Champagne, Mathieu Roy, Philippe Albouy, Michel-Pierre Coll, Cem Subakan
Université Laval, Université Laval, Universite Laval, Université Laval

Decifra: Deep Extraction Of Causally Informed Features Via Restricted Architecture

Pavel Popov, Cristian Morasso, Giorgio Dolci, Ilaria Boscolo Galazzo, Godfrey Pearlson, David Danks, Vince Calhoun, Gloria Menegaz, Sergey Plis
Georgia State University, University of Verona, University of California, San Diego, Università degli Studi di Verona, Georgia State University

Uncovering K-Way Balanced Consensus Communities In Signed Multilayer Brain Networks

Sema Athamnah, Selin Aviyente
Michigan State University, Michigan State University

Hypergraph Overlapping Community Detection For Brain Networks

Duc Vu, Selin Aviyente
Michigan State University, Michigan State University

Deep Learning Of Mesoscale Cortical Dynamics For Real-Time Classification Of Forelimb Movement In Mice

Clément Picard, Anton A. Dogadov, Daniel E. Shulz, Isabelle Ferezou, Valerie Ego-Stengel, LUC ESTEBANEZ
Université Paris-Saclay, CNRS, CNRS, CNRS, CNRS, CNRS

Learning Theory, Optimization and Algorithms (Dolmabahce Hall)

Fast And Robust Training Of Deep Learning Models With Multiplicative Adagrad

Manos Kirtas, Nikolaos Passalis, Anastasios Tefas
Aristotle University of Thessaloniki, Aristotle University of Thessaloniki, Aristotle University of Thessaloniki

Information Entropy-Based Scheduling For Communication-Efficient Decentralized Learning

Jaiprakash Nagar, Zheng Chen, Marios Kountouris, Photios A. Stavrou
Eurecom, Linköping University, Universidad de Granada, Eurecom

Model Recycling Framework For Multi-Source Data-Free Supervised Transfer Learning

Sijia Wang, Ricardo Henao
Duke University, Duke University

Meta-Tree: Bayesian Approach To Avoid Overfitting In Decision Trees And Analysis On The Application To Boosting

Naoki Ichijo, Toshiyasu Matsushima
Waseda University, Waseda University

Model-Agnostic Uncertainty Calibration For Noisy Constraint Modeling In Bainitic Steel Optimization

Sophie Steger, Bernd Schuscha, Franz Pernkopf
Technische Universität Graz, Montanuniversität Leoben, Graz University of Technology

Hess-Mc^2: Sequential Monte Carlo Squared Using Hessian Information And Second Order Proposals

Joshua Murphy, Conor Rosato, Andrew Millard, Lee Devlin, Paul Horridge, Simon Maskell
University of Liverpool, University of Liverpool, University of Liverpool, University of Liverpool

Attention Augmented Structure-Centric Bias Mitigation With Feature Disentanglement

Xuege Hou, Ya-Li Li, Shengjin Wang
Tsinghua University, Tsinghua University, Tsinghua University, Tsinghua University, Tsinghua University

Apa: Domain Generalization Using Frequency Based Augmentation

Sina Salehnia, Erchan Aptoula, Oznur Tastan
Sabanci University, Sabanci University, Microsoft Research

Perturbation-Based Multiview Graph Learning With Consensus Graph

Mohammad Alwardat, Selin Aviyente
Michigan State University, Michigan State University

Shapley-Based Data Valuation With Mutual Information: A Key To Modified K-Nearest Neighbors

Mohammad Ali Vahedifar, Azim Akhtarshenas, Mohammad Mohammadi RafatPanah, Maryam Sabbaghian
Aarhus University, Universidad Politécnica de Valencia, University of Tehran, University of Tehran, University of Tehran, University of Tehran

Toward Sustainable Continual Learning: Detection And Knowledge Repurposing For Reoccurring Tasks

Sijia Wang, Yoojin Choi, Junya Chen, Mostafa El-Khamy, Ricardo Henao
Duke University, , Duke University, Samsung Semiconductor, INC. , Duke University

Online Topology Identification Of Higher-Order Cell Structures

Abdullah Canbolat, Rohan Money, Baltasar Beferull-Lozano
Simula Metropolitan Center for Digital Engineering, Simula Research Laboratory, SIMULA

Benefits Of Online Tilted Empirical Risk Minimization: A Case Study Of Outlier Detection And Robust Regression

Yiğit Emir Yıldırım, Samet Demir, Zafer Dogan
Koç University, Koc University, Koc University

Emorf-Ii: Adaptive Em-Based Outlier-Robust Filtering With Correlated Measurement Noise

Arslan Majal, Aamir Hussain Chughtai, Muhammad Tahir
Lahore University of Management Sciences, Lahore University of Management Sciences

Special Session: Large Vision Language Models (LVLMs) and their Application to Document Understanding (Dolmabahce Hall)

Trust The Model: Compact Vlms As In-Context Judges For Image-Text Data Quality

Daulet Toibazar, Kesen Wang, Mohamed Sayed, Sherif Mohamed, Pedro J Moreno Mengibar
Humain AI, Humain, University of Oulu, thefutureai, Carnegie Mellon University

Multi-Agent Interactive Question Generation Framework For Long Document Understanding

Tsutahiro Fukuhara, Junya Hara, Hiroshi Higashi, Yuichi Tanaka
The University of Osaka

Enhanced Arabic Text Retrieval With Attentive Relevance Scoring

Salah Eddine Bekhouche, Azeddine Benlamoudi, YAZID BOUNAB, Fadi Dornaika, Abdenour Hadid
Huawei Technologies Ltd., Université Kasdi Merbah Ouargla, University of Helsinki, Universidad del País Vasco, Paris-Sorbonne University Abu Dhabi

Learning Or Cheating? Assessing Data Contamination In Large Vision-Language Models

Ahmed Masry, Mahir Ahmed, Ridwan Mahbub
York University, York University, York University

Colflor: Towards Bert-Size Vision-Language Document Retrieval Models

Ahmed Masry, Enamul Hoque
York University, York University

Diffusion, Generative and Representation Learning (Dolmabahce Hall)

Mprdiff: Mixed Precision Restorative Diffusion Model With Incoherence Processing

Chih-Sheng Cheng, Yu-Shan Tai, Yen-Hsi Lee, Kai-Ya Wei, An-Yeu Andy Wu
National Taiwan University, National Taiwan University, National Taiwan University

Backdoor Inversion In Neural-Activation Space

Guangmingmei Yang, Xi Li, Hang Wang, George Kesidis, David J. Miller
Pennsylvania State University, University of Alabama at Birmingham, Pennsylvania State University, Pennsylvania State University, Pennsylvania State University

Contrastive Disentanglement Learning For Empathetic Generation

Jen-Tzung Chien, Ho-Jhong Liu
National Yang Ming Chiao Tung University,

Compression Beyond Pixels: Semantic Compression With Multimodal Foundation Models

Ruiqi Shen, Haotian Wu, Wenjing Zhang, Jiangjing Hu, Deniz Gunduz
Fudan University, Imperial College London, Beijing University of Posts and Telecommunications, Beijing University of Posts and Telecommunications, Imperial College London

Diffusion-Based Connectionist Temporal Classification

Jen-Tzung Chien, *Chia-Kai Yeh*
National Yang Ming Chiao Tung University,

Foundation Model-Aided Video Semantic Communication: Framework Design And Prototype Validation

Jiarun Ding, *Peiwen Jiang*, *Chao-Kai Wen*, *Xiao Li*, *Shi Jin*
Southeast University, Southeast University, Southeast University

Frenbrdf: A Frequency-Rectified Neural Material Representation

Chenliang Zhou, *Zheyuan Hu*, *Cengiz Oztireli*
University of Cambridge, University of Cambridge, University of Cambridge

Ptychographic Image Reconstruction From Limited Data Via Score-Based Diffusion Models With Physics-Guidance

Refik Mert Cam, *Junjing Deng*, *Rajkumar Kettimuthu*, *Mathew J. Cherukara*, *Tekin Bicer*
University of Illinois at Urbana-Champaign, University of Chicago, University of Chicago

Stability And Performance Analysis Of Diffusion Learning For Two-Network Competing Problems

Vladyslav Shashkov, *Flávio Pavan*, *Haoyuan Cai*, *Ali H. Sayed*
EPFL - EPF Lausanne, EPFL - EPF Lausanne, EPFL - EPF Lausanne

Wednesday Session

Session Chairs: Selin Aviyente and Mirco Ravanelli

Federated & Decentralized Learning (Marmara Hall)

Federated Domain Generalization With Label Smoothing And Balanced Decentralized Training
Milad Soltany, Mahdiyar Molahasani, Farhad Pourpanah, Michael Greenspan, Ali Etemad
Queen's University, Queen's University, Queen's University, Queens University, Queen's University

Enhancing Federated Learning Convergence With Dynamic Data Queue And Data-Entropy-Driven Participant Selection
Charuka Herath, Xiaolan Liu, Sangarapillai Lambotharan, Yogachandran RAHULAMATHAVAN
Loughborough University, University of Bristol, , Loughborough University

Provable Reduction In Communication Rounds For Non-Smooth Convex Federated Learning
Karlo Palenzuela, Ali Dadras, Alp Yurtsever, Tommy Löfstedt
Umea University, Umea University, Umeå University, Umeå University

Joint Graph Estimation And Signal Restoration For Robust Federated Learning
Tsutahiro Fukuhara, Junya Hara, Hiroshi Higashi, Yuichi Tanaka
The University of Osaka

Memory-Efficient Correlated Noise For Locally Differentially Private Momentum In Distributed Learning
Yue Huang, Jiaojiao Zhang, Qing Ling
SUN YAT-SEN UNIVERSITY, KTH Royal Institute of Technology, SUN YAT-SEN UNIVERSITY

Demem: Privacy-Enhanced Robust Adversarial Learning Via De-Memorization
Xiaoyu Luo, Qiongxiu Li
Aalborg University, Aalborg University, Aalborg University

Decision Making, Bandits, and Recommendation Systems (Marmara Hall)

A Distillation-Based Future-Aware Graph Neural Network For Stock Trend Prediction
Zhipeng Liu, Peibo Duan, Mingyang Geng, Bin zhang
Northeastern University, Northeastern University, National University of Defense Technology

Learning From Multiple Noisily Optimal Demonstrators In Stochastic Multi Armed Bandits
Hongyu Wang, Panagiotis Traganitis
Michigan State University, Michigan State University

Networked Contextual Bandits With Anomaly-Aware Learning
Xiaotong Cheng, Setareh Maghsudi
Ruhr-Universität Bochum, Ruhr-Universtät Bochum

State Prediction For Offline Reinforcement Learning Via Sequence-To-Sequence Modeling

Abdelghani Ghanem, Mounir Ghogho, Philippe Ciblat
International University of Rabat, University Mohammed VI Polytechnic, Télécom Paris

Poisson-Based Modeling And Curvature-Aware Optimization For Neural Collaborative Filtering In Recommendation Systems

Iwao Tanuma, Tomoko Matsui
Dwango, co Ltd., The Institute of Statistical Mathematics, Japan, Tokyo Institute of Technology

Integrating Adaptive Prediction With An Optimization-Based Methodology For Data-Driven Efficiency Evaluation In Education

Priscila Cristina Berbert Rampazzo, damaris chieregato vicentin, Leonardo Tomazeli Duarte, Gustavo Hermínio Salati Marcondes de Moraes, BETANIA S. C. CAMPELLO
Universidade Estadual de Campinas, Universidade Estadual de Campinas

What Does An Audio Deepfake Detector Focus On? A Study In The Time Domain

Petr Grinberg, Ankur Kumar, Surya Koppisetti, Gaurav Bharaj
Reality Defender Inc, Reality Defender AI

Collabpersona: A Framework For Collaborative Decision Analysis In Persona Driven Llm-Based Multi-Agent Systems

Onat Arda Tamer, Abdurrahman Gumus
İzmir Institute of Technology

ML for Medical Applications (Dolmabahce Hall)

Cycle-Consistent Diffusion Model With Vessel-Aware Attention For Endoscopic Image Translation

Meryem Amaouche, Ouassim Karrakchou, Mounir Ghogho, Christian Daul, Anouar Elghazzaly, Mohamed Alami, Ahmed Ameur
International University of Rabat, International University of Rabat, University Mohammed VI Polytechnic

Diffkillr: Killing And Recreating Diffeomorphisms For Cell Annotation In Dense Microscopy Images

Chen Liu, Danqi Liao, Alejandro Parada-Mayorga, Alejandro Ribeiro, Marcello DiStasio, Smita Krishnaswamy
Yale University, Yale University, University of Pennsylvania, Yale University

Imageflownet: Forecasting Multiscale Image-Level Trajectories Of Disease Progression With Irregularly-Sampled Longitudinal Medical Images

Chen Liu, Ke Xu, Liangbo Linus Shen, Guillaume Huguet, Zilong Wang, Alexander Tong, Danilo Bzdok, Jay M. Stewart, Jay C Wang, Lucian Del Priore, Smita Krishnaswamy
Yale University, Yale University, University of California, San Francisco, University of Montreal, McGill University, McGill University, Duke University, McGill University, University of California, San Francisco, University of California, San Francisco, Yale University, Yale University

Svd Based Least Squares For X-Ray Pneumonia Classification Using Deep Features

Mete Erdogan, Sebnem Demirtas
Stanford University, Koç University

Rsr-Nf: Neural Field Regularization By Static Restoration Priors For Computed Dynamic Imaging

Berk Iskender, Sushan Nakarmi, Nitin Daphalapurkar, Marc Louis Klasky, Yoram Bresler
Analog Devices, Inc., Los Alamos National Laboratory, Los Alamos National Laboratory, Los Alamos National Laboratory, University of Illinois at Urbana-Champaign

Closing The Gap In Multimodal Medical Representation Alignment

Eleonora Grassucci, Giordano Cicchetti, Danilo Comminiello
Sapienza University of Rome, University of Roma "La Sapienza", Sapienza University of Rome

Adaptable Non-Parametric Approach For Speech-Based Symptom Assessment: Isolating Private Medical Data In A Retrieval Datastore

Yu-Wen Chen, Julia Hirschberg
Columbia University, Columbia University

"Digital Washing" Of Semen Time-Lapse Images

Ludvik Alkhoury, Atilla Sivri, Ji-won Choi, Justin Bopp, Albert Anouna, Andreas W. Henkel, Matthew VerMilyea, Moshe Kam
New Jersey Institute of Technology, New Jersey Institute of Technology

Strokevision-Bench: A Multimodal Video And 2D Pose Benchmark For Tracking Stroke Recovery

David Robinson, Animesh Gupta, Rizwan Qureshi, Qiushi Fu, Mubarak Shah
University of Central Florida, University of Central Florida, University of Central Florida, Amazon

Does Language Matter For Early Detection Of Parkinson’S Disease From Speech?

Peter Plantinga, Briac Cordelle, Dominique Louër, Mirco Ravanelli, Denise Klein
McGill University, Concordia University, Concordia University, McGill University

Human Activity Recognition, Physiological Signals & Wearables (Dolmabahce Hall)

Osr: Toward Developing Efficient Federated Learning-Based Human Activity Recognition Using Optimal Server Representations

Ensieh Khazaei, Dimitrios Hatzinakos
University of Toronto, University of Toronto, University of Toronto

Compressed And Lightweight Cnn For Real-Time Parkinson’s Tremor Detection From Wearable Imu Data

Ege Ozkoc, Tobias Sebastian Zech, Norman Pfeiffer, Stephan Göb, Jürgen Frickel
University of Pittsburgh, Fraunhofer IIS, Fraunhofer IIS, Friedrich-Alexander-Universität Erlangen-Nürnberg

Subject Invariant Contrastive Learning For Human Activity Recognition

Yavuz Yarici, Kiran Premdat Kokilepersaud, Mohit Prabhushankar, Ghassan AlRegib
Georgia Institute of Technology, Georgia Institute of Technology, Georgia Institute of Technology, Georgia Institute of Technology

Graph Structure Learning With Local Connectivity Refinement For Improved Physiological Emotion Recognition

Woan-Shiuan Chien, Mei-Yen Tsai, Chi-Chun Lee
National Tsinghua University, National Tsinghua University

Interbeat Interval Filtering

Ilker Bayram
New York University

Classification Filtering

Ilker Bayram
New York University

Embedded Inter-Subject Variability In Adversarial Learning For Inertial Sensor-Based Human Activity Recognition

Francisco Miguel Calatrava-Nicolás, Shoko Miyauchi, Vitor Fortes Rey, Paul Lukowicz, Todor Stoyanov, Oscar M Mozos
Örebro University, Kyushu University, TU Kaiserslautern, German Research Center for AI, Örebro University, Örebro University, Sweden

Special Session: Decoding the Brain Time Series (Dolmabahce Hall)

Toward A Gaze-Independent Brain-Computer Interface Using The Code-Modulated Visual Evoked Potentials

Radovan Vodila, Juliette Claire van Lohuizen, Jordy Thielen
Radboud University, , Donders Institute for Brain, Cognition and Behaviour

Assessing The Capabilities Of Large Brainwave Foundation Models

Na Lee, Stylianos Bakas, Konstantinos Barmpas, Yannis Panagakis, Dimitrios Adamos, Nikolaos Laskaris, Stefanos Zafeiriou
Cogitat Ltd, Cogitat Ltd., Imperial College London, National and Kapodistrian University of Athens, Imperial College London, Aristotle University of Thessaloniki, Google

Uncertainty Quantification For Motor Imagery Bci - Machine Learning Vs. Deep Learning

Joris Suurmeijer, Ivo Pascal de Jong, Matias Valdenegro-Toro, Andreea Ioana Sburlea
University of Groningen, University of Groningen, University of Groningen, University of Groningen

On The Role Of Low-Level Visual Features In Eeg-Based Image Reconstruction

JUNKAI YANG, Arno Onken
University of Edinburgh, University of Edinburgh, University of Edinburgh

Interpretability Of Riemannian Tools Used In Brain Computer Interfaces

Thibault de Surrel, Tristan Venot, Marie-Constance Corsi, Florian Yger
Université Paris-Dauphine-PSL, INRIA, INRIA, Institut National des Sciences Appliquées de Rouen

Absolutenet: A Deep Learning Neural Network To Classify Cerebral Hemodynamic Responses Of Auditory Processing

Behtom Adeli, John McLinden, Pankaj Pandey, Ming Shao, Yalda Shahriari
University of Rhode Island, University of Rhode Island, St. Jude Children's Research Hospital, University of Massachusetts at

Lowell, University of Rhode Island

Riemannian Fusions Of Eeg-Based Features For Motor Imagery Detection Under Propofol Sedation

Valérie Marissens Cueva, Camilla Mannino, Marie-Constance Corsi, Fabien Lotte, Sébastien RIMBERT, Laurent Bougrain
INRIA, Sorbonne Université - Faculté des Sciences (Paris VI), INRIA, INRIA, INRIA, Université de Lorraine

Evaluating Manifold Alignment Of Motor Imagery For Transfer Learning In Eeg-Based Bcis

Seidi Yonamine Yamauti, Rodrigo Marques de Melo Santiago, Gerôncio Oliveira da Silva Filho, Thayse Saraiva de Albuquerque, Gabriel Alves Mendes Vasiljevic
Instituto Santos Dumont, Santos Dumont Institute, University of Camerino, Instituto Santos Dumont, Instituto Santos Dumont

Data Competition, VEELA - Vessel Extraction and Extrication for Liver Analysis (Dolmabahce Hall)

Hepatic Vessel Segmentation and Classification in CTA Images Using NNU-Net with Centerline Regression

Mustafa Ege Seker, Mustafa Said Kartal, Ariorad Moniri, Orhan Ozkan
University of Wisconsin-Madison, Sivas Cumhuriyet University, Acibadem Mehmet Ali Aydinlar University, University of Wisconsin-Madison

Hybrid Boundary Sensitive Tversky 3D U-Net for Liver Vessel Segmentation

Baran Cilga, Ece Tugba Cebeci, Musa Balci, Kardelen Pecenek
Viseur AI, Viseur AI, Viseur AI, Viseur AI

Veela Challenge - Vessel Extraction and Extrication for Liver Analysis

Tugce Toprak, Ziya Ata Yazıcı, Ilkay Oksuz, Ilker Ozgur Koska, Pervin Bulucu, N. Sinem Gezer, Ufuk Besenk, A. Emre Kavur, Pierre-Henri Conze, Hazım Kemal Ekenel, Oguz Dicle, M. Alper Selver
Dokuz Eylul University, Istanbul Technical University,IMT Atlantique, NYU Abu Dhabi

Social Program

Banquet Dinner

Date: Tuesday, September 2
Location: We will leave the conference venue at 18.15. The bus will leave us at Kabatas pier, where we will take the boat: https://maps.app.goo.gl/wSECUZXapXxhBrMx5 At the end of the boat ride, we will return back to Kabatas pier.
Time: 18:15 - 22:00
If you do not have a ticket, additional tickets in very limited numbers might be available. Contact Mustafa Bay (`mustafabay@dekon.com.tr`) or volunteers for inquiries.

This is a special occasion, and it is a great opportunity to appreciate Istanbul in a boat ride through Istanbul Bosphorus.

Welcome Cocktail

Date: Sunday, August 31
Location: Marmara Hall (18.00-18.30) — Anadolu Foyer-Ground Floor (18.30 - 21.00)
Time: 18:00 - 21:00

Join us for the opening ceremony of MLSP 2025, where we will first detail the conference content, and then enjoy the evening with live Turkish classical art music and food!

Social Dinners

Dates: September 1, September 3, we will leave around 6.15pm both days.

On September 1, we will go to ‘Adana Il Siniri’ grill restaurant. This is a traditional style meat/grill restaurant, the price is 2750 TL (Including %20 VAT) without alcohol. 3300 TL (Including%20 VAT) with alcohol.
https://maps.app.goo.gl/HtRSNuAgG55APtUr8.

On September 3, we will walk to ‘Cicek Pasaji’ from the conference venue. You will have the chance to see ‘Istiklal street’, which is a common tourist destination. Cicek pasaji (Cité de Péra) is also a historic building, where we will eat. We will get a fixed menu, the price is 2880 TL (Incl.%20 VAT)
https://www.sevicrestaurant.com/
https://maps.app.goo.gl/7mkKjYrQFEvJXshz5

If you have already filled out the form your spot is guaranteed. If not, you can still come with us. In the case the restaurant is full, there are other restaurants nearby.

List of Reviewers

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RED ROUTE M2

Osmanbey Metro to Lütfi Kırdar Congress Center

- **Osmanbey Metro – Pangaltı Exit ➔ Halaskargazi Street**
  Leave the metro through the **Pangaltı exit** and step onto **Halaskargazi Street**.
- **Halaskargazi Street ➔ Zafer Street**
  Walk a short distance along **Halaskargazi Street**, then turn **right onto Zafer Street**.
- **Zafer Street ➔ Süleyman Nazif Street**
  Continue on Zafer Street and then turn **left onto Süleyman Nazif Street**.
- **Süleyman Nazif Street ➔ Maçka Art Park**
  At the end of Süleyman Nazif Street, you will reach **Maçka Art Park**. Enter the park and walk through it.
- **Maçka Art Park ➔ Darülbedayi Street**
  Follow the walking path inside the park until you exit onto **Darülbedayi Street**.
- **Darülbedayi Street ➔ Lütfi Kırdar Congress Center (VIP 1 Entrance)**
  Continue along Darülbedayi Street; the **Lütfi Kırdar Congress Center** will be on your **left side**. You can enter from the **VIP 1 entrance**.

BLUE ROUTE M2

Gezi Park to Lütfi Kırdar Congress Center

- **Gezi Park Exit ➔ Askerocağı Street**
  Exit the metro at **Gezi Park**; you will be on **Askerocağı Street**.
- **Askerocağı Street ➔ Divan Hotel**
  Walk straight towards **Cumhuriyet Street**; on your right you will first see the **Divan Hotel**.
- **Askerocağı Street ➔ Radisson Hotel**
  Keep walking along **Askerocağı Street**; further ahead on your right you will see the **Radisson Hotel**.
- **Turn Right onto Darülbedayi Street**
  Continue straight, then turn **right onto Darülbedayi Street**. At the entrance, the **Harbiye Orduevi** will be on your left and the **Hilton Bosphorus Hotel** in front of you.
- **Darülbedayi Street Landmarks**
  Walk along **Darülbedayi Street**; you will pass the **Istanbul Congress Center** on your left, then the **Muhsin Ertuğrul Theater** also on your left.
- **Darülbedayi Street ➔ Lütfi Kırdar Congress Center (VIP 1 Entrance)**
  Continue on the same street; the **Lütfi Kırdar Congress Center** will be on your **right side**. Enter through the **VIP 1 entrance**.

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