LOD & ACAIN 2022

A Conference, a Course, and a Symposium in a Unique Event

Castelnuovo Berardenga, Tuscany, Italy

LOD2022

The 8th International Conference on
Machine Learning, Optimization, and Data Science

ACAIN 2022

The 2nd Advanced Course & Symposium on
Artificial Intelligence & Neuroscience

September 18 – 22, 2022 – Certosa di Pontignano, Castelnuovo Berardenga – Tuscany, Italy

The 8th International Conference on machine Learning, Optimization & Data science – LOD 2022
https://lod2022.icas.cc
lod@icas.cc

and

The 2nd International Advanced Course & Symposium on Artificial Intelligence & Neuroscience – ACAIN 2022
https://acain2022.artificial-intelligence-sas.org
acain@icas.cc

September 18 – 22, 2022

A Conference, a Course, and a Symposium in a Unique Event
Certosa di Pontignano – Castelnuovo Berardenga, Tuscany, Italy

Program Ver.6.0 – This programme is tentative and subject to change.
Time Zone: CEST, UTC +2, Rome, Italy

Time (CEST)	**Sunday September 18**	**Monday September19**	**Tuesday September 20**	**Wednesday September 21**	**Thursday September 22**
09:00 – 09:45		Rema Padman	Karl Friston	Michail Tsodyks	Panos Pardalos
09:45 – 10:30		Jürgen Bajorath	Karl Friston	Máté Lengyel	Christina Kyrousi
10:30 – 11:00		Coffee break	Coffee break	Coffee break	Coffee break
11:00 – 11:45		Sidath Handurukande	Wulfram Gerstner	Panos Pardalos	Sessions 17 -18 & Concluding
11:45 – 12:30		Sessions 1- 3	Wulfram Gerstner	Sessions 15 -16	
12:30 – 13:15			Michail Tsodyks		
13:15 –14:40	Registration (13:40-14:40)	Lunch	Lunch	Lunch	Lunch (13:30-15:00)
14:40 – 15:25	Opening & Ross King	Sessions 4 - 6	Christos Papadimitriou	**Social Tour:** **Guided Visit of Siena**	Delivery of Certificates of Attendance and Free Time (15:00-16:10)
15:25 – 16:10	Pierre Baldi		Christos Papadimitriou		
16:10 – 16:40	Coffee break	Coffee break	Coffee break		**Guided Visit of the Certosa di Pontignano & Wine Tasting**
16:40 – 17:25	Varun Ojha	Sessions 7- 8	Máté Lengyel		
17:25 – 18:10			Sessions 9 -11		
18:10 – 18:20	Pause	Pause	Pause		
18:20 – 19:20	Simone Scardapane	Christina Kyrousi	Sessions 12 -14		
19:20 – 20:05					
20:05	Dinner	Dinner	Dinner	Dinner	Social Dinner*

The Plenary Sessions are in blue (Conference room 1: Sala Bracci, Zoom virtual room: LOD-ACAIN1)
* instructions are on the next page (page 2)

Parallel Sessions:
Conference room 1: *onsite* **Sala Bracci** (and *online* Zoom virtual room n. 1: LOD-ACAIN1 "Sala Bracci")
Conference room 2: *onsite* **Sala Veranda** (and *online* Zoom virtual room n. 2: LOD-ACAIN2 "Sala Veranda")
Conference room 3: *onsite* **Sala Palio** (and *online* Zoom virtual room n. 3: LOD-ACAIN3 "Sala Palio")

Arrival: *Sunday, September 18*
Departure: *Friday, September 23*
Registration: *Sunday, September 18 (11:45-14:40)*
Upon registration at the desk, you will receive your badge. To facilitate the process, please bring your registration confirmation. You are kindly requested to wear your name badge during all events of the conference.
Social Dinner * For Extra Gala Dinner Tickets and/or Walks, please send an email to lod@icas.cc AND acain@icas.cc thanks.
Please communicate your dietary needs (e.g., gluten-free, celiac, vegetarian, vegan, food allergies, and other dietary needs) asap, thank you.
Please send an email to info@lacertosadipontignano.com thanks.
WiFi Name: Silver (it is an open Wi-Fi); if you have login and password, you can use Eduroam.
Social Activities: Visit of the Certosa di Pontignano, Tour in the Tuscan Countryside and Wine Tasting

- Guided tour of the Certosa di Pontignano, guided visit to the famous Certosa Chapel (called the Sistine Chapel of Siena).
- Guided tour of Siena.
- Wine Tasting of Tuscan Wines (e.g., Chianti Classico, Chianti Classico Riserva, Chianti Classico Gran Selezione, etc.) produced in Siena, in general, and in the surroundings of the Certosa di Pontignano, in particular.

LOD 2022 Keynote Speakers

Jürgen Bajorath, *University of Bonn, Germany*
"Exploring multi-target activities of small molecules through explainable machine learning"

Pierre Baldi, *University of California Irvine, USA*
"The Quarks of Attention"

Ross King, *University of Cambridge, UK The Alan Turing Institute*
"Automating Science using Robot Scientists"

Rema Padman, *Carnegie Mellon University, USA*
"Healthcare Informatics and Analytics"

Panos Pardalos, *University of Florida, USA*
"Computational Approaches for Solving Systems of Nonlinear Equations"

LOD 2022 Invited Speakers

Sidath Handurukande, *Huawei Ireland Research Center in Dublin, Ireland*
"*From AI-assisted to AI-native network management*" – Talk + Round Table

LOD 2022 Tutorial Speakers

Varun Ojha, *University of Reading, UK*
"Backpropagation Neural Tree"
"Sensitivity Analysis of Deep Learning and Optimization Algorithms"

Simone Scardapane, *University of Rome "La Sapienza", Italy*
"Alice in the Autodiff Wonderland"

Past LOD Keynote Speakers

Ioannis Antonoglou, DeepMind, London, UK
Pierre Baldi, *University of California Irvine, USA*
Yoshua Bengio, *Montreal Institute for Learning Algorithms (MILA) & University of Montreal, Canada*
Bettina Berendt, *TU Berlin, Germany*
Jörg Bornschein, *DeepMind, London, UK*
Michael Bronstein, *Imperial College London, UK*
Roberto Cipolla, University of Cambridge, UK
Nello Cristianini, *University of Bristol, UK*
Peter Flach, *University of Bristol, UK*
Marco Gori, *University of Siena, Italy*
Arthur Gretton, *UCL, UK*
Arthur Guez, *Google DeepMind, Montreal, UK*
Yi-Ke Guo, *Imperial College London, UK*
George Karypis, *University of Minnesota, USA*
Vipin Kumar, *University of Minnesota, USA*
Marta Kwiatkowska, *University of Oxford, UK*
Angelo Lucia, *University of Rhode Island, USA*
George Michailidis, *University of Florida, USA*
Kaisa Miettinen, *University of Jyväskylä, Finland*

Stephen Muggleton, *Imperial College London, UK*
Panos Pardalos, *University of Florida, USA*
Jan Peters, *Technische Universitaet Darmstadt & Max-Planck Institute for Intelligent Systems, Germany*
Tomaso Poggio, *MIT, USA*
Andrey Raygorodsky, *Moscow Institute of Physics and Technology, Russia*
Mauricio G. C. Resende, *Amazon.com Research and University of Washington Seattle, Washington, USA*
Verena Rieser, Heriot Watt University, UK
Raniero Romagnoli, *Almawave, Italy*
Ruslan Salakhutdinov, *Carnegie Mellon University, USA, and AI Research at Apple*
Maria Schuld, *Xanadu & University of KwaZulu-Natal, South Africa*
My Thai, *University of Florida, USA*
Richard E. Turner, *University of Cambridge, UK*
Ruth Urner, *York University, Toronto, Canada*
Isabel Valera, *Saarland University, Saarbrücken & Max Planck Institute for Intelligent Systems, Tübingen, Germany*

ACAIN 2022 Lecturers

Karl Friston, *University College London, UK*
"Me and my Markov blanket"
Second Lecture TBA

Wulfram Gerstner, *EPFL, Switzerland*
"Eligibility traces and three-factor rules of synaptic plasticity: from reward to surprise"
"No Backprop please! Learning hierarchical representations with neoHebbian learning rules"

Máté Lengyel, *Cambridge University, UK (TBC)*
First Lecture TBA
Second Lecture TBA

Christos Papadimitriou, *Columbia Engineering, Columbia University, USA*
First Lecture TBA
Second Lecture TBA

Michail Tsodyks, *Institute for Advanced Study, USA*
"Putative neuronal underpinnings of working memory"
"Mathematical models of human memory"

ACAIN 2022 Tutorial Speaker

Christina Kyrousi, *National and Kapodistrian Univeristy of Athens, Greece*
"Modelling brain development and disorders – organoids as a model system"
"Extrinsic and intrinsic mechanisms modulating human corticogenesis"
Third Lecture TBA

Past ACAIN Keynote Speakers

Timothy Behrens, Nuffield Department of Clinical Neurosciences, University of Oxford, UK
Matthew Botvinick, DeepMind, London, UK & Gatsby Computational Neuroscience Unit, UCL, UK
Claudia Clopath, Computational Neuroscience Lab, Dept. of Bioengineering, Imperial College London, UK
Ila Fiete, Dept. of Brain and Cognitive Sciences MIT, USA
Karl Friston, Institute of Neurology, University College London, UK & Wellcome Trust Centre for Neuroimaging
Rosalyn Moran, Department of Neuroimaging, King's College London, UK
Maneesh Sahani, Gatsby Computational Neuroscience Unit, University College London, UK
Jane Wang, DeepMind, London, UK

LOD & ACAIN 2022 Programme

Sunday, September 18

11:45 – 14:40 Registration

Plenary Session
Conference room 1: **Sala Bracci** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giuseppe Di Fatta

14:40 **Opening: Giuseppe Nicosia & Panos Pardalos**

14:40 – 15:25 LOD Keynote Speaker:
Ross King, *University of Cambridge, UK & The Alan Turing Institute, London, UK*
"Automating Science using Robot Scientists"

15:25 – 16:10 LOD Keynote Speaker:
Pierre Baldi, *University of California Irvine, USA*
"The Quarks of Attention"

16:10 – 16:40 Coffee Break

Plenary Session
Conference room 1: **Sala Bracci** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giuseppe Di Fatta

16:40 – 18:10 LOD Tutorial Speaker:
Varun Ojha, *University of Reading, UK*
"Backpropagation Neural Tree"
"Sensitivity Analysis of Deep Learning and Optimization Algorithms"

18:10 – 18:20 Pause

18:20 – 20:05 LOD Tutorial Speaker:
Simone Scardapane, *University of Rome "La Sapienza", Italy*
"Alice in the Autodiff Wonderland"

20:05 Dinner

Monday, September 19

Plenary Session
Conference room 1: **Sala Bracci** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Varun Ojha

09:00 – 09:45 LOD Keynote Speaker:
Rema Padman, *Carnegie Mellon University, USA*
"Healthcare Informatics and Analytics"

09:45 – 10:30 LOD Keynote Speaker:
Jürgen Bajorath, *University of Bonn, Germany*
"Exploring multi-target activities of small molecules through explainable machine learning"

10:30 – 11:00 Coffee break

11:00 – 11:45 LOD Invited Speaker + Round Table
Sidath Handurukande, Huawei, Ireland
"From AI-assisted to AI-native network management"

Parallel Session 1
Conference room 1: **Sala Bracci** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Varun Ojha

11:45 – 12:00 Bram De Cooman, Johan Suykens and Andreas Ortseifen. Enforcing hard state-dependent action bounds on deep reinforcement learning policies (onsite)

12:00 – 12:15 Eugenio Lomurno and Matteo Matteucci. On the utility and protection of optimization with differential privacy and classic regularization techniques (onsite)

12:15 – 12:30 Meyssa Zouambi, Julie Jacques and Clarisse Dhaenens. LS-PON: a Prediction-based Local Search for Neural Architecture Search (onsite)

12:30 – 12:45 Junzheng Wu, Eric Paquet, Herna Viktor and Wojtek Michalowski. Adapting to Complexity: Deep Learnable Architecture for Protein-protein Interaction Predictions (online)

12:45 – 13:00 Weijia Shao and Sahin Albayrak. Adaptive Zeroth-Order Optimisation of Nonconvex Composite Objectives (online)

13:00 – 13:15 Abdul Wahhid, Jiafeng Zhu and Stefano Mauceri. Digital Twin Modelling: Potential Value of Digital Twins and Comparison of the Modelling Languages (online)

Parallel Session 2
Conference room 2: **Sala Veranda** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Emanuele La Malfa

11:45 – 12:00 Matthew Hutchings and Bertrand Gauthier. Local optimisation of Nyström samples through stochastic gradient descent (onsite)

12:00 – 12:15 Hông-Lan Botterman, Julien Roussel, Thomas Morzadec, Ali Jabbari and Nicolas Brunel. Robust PCA for Anomaly Detection and Data Imputation in Seasonal Time Series (onsite)

12:15 – 12:30 Andrea Asperti and Marco Del Brutto. MicroRacer: a didactic environment for Deep Reinforcement Learning (onsite)

12:30 – 12:45 Pedro Henrique da Costa Avelar, Roman Laddach, Sophia Karagiannis, Min Wu and Sophia Tsoka. Multi-Omic Data Integration and Feature Selection for Survival-based Patient Stratification via Supervised Concrete Autoencoders (onsite)

12:45 – 13:00 Sabrina Stephanie Göllner, Marina Tropmann-Frick and Boštjan Brumen. Aspects and Views on Responsible Artificial Intelligence (online)

13:00 – 13:15 Wadhah Zai El Amri, Luca Hermes and Malte Schilling. Hierarchical Decentralized Deep Reinforcement Learning Architecture for a Simulated Four-Legged Agent (online)

Parallel Session 3
Conference room 3: **Sala Palio** (Zoom virtual room: LOD-ACAIN3)
Chair(s): Gabriele La Malfa

11:45 – 12:00 Vincent Vigneron and Hichem Maaref. A non-parametric pooling operator capable of texture extraction (online)

12:00 – 12:15 Ross A. J. McLaren, Kehinde Oluwatoyin Babaagba and Zhiyuan Tan. A Generative Adversarial Network Based Approach to Malware Generation Based on Behavioural Graphs (online)

12:15 – 12:30 Pascal Mettes. Hyperbolic Graph Codebooks (online)

12:30 – 12:45 Galina Samigulina and Zarina Samigulina. Biologically inspired unified artificial immune system for industrial equipment diagnostic (online)

12:45 – 13:00 Angelo Impedovo, Emanuele Pio Barracchia and Giuseppe Rizzo. Intelligent Robotic Process Automation for Supplier Document Management on E-Procurement Platforms (online)

13:00 – 13:15 Philip Stahmann and Bodo Rieger. A Benchmark for Real-Time Anomaly Detection Algorithms Applied in Industry 4.0 (online)

13:15 – 14:40 Lunch

Parallel Session 4
Conference room 1: **Sala Bracci** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Emanuele La Malfa

14:40 – 14:55 Kanishka Ghosh Dastidar, Wissam Siblini and Michael Granitzer. Expressive and Intuitive Models for Automated Context Representation Learning in Credit-Card Fraud Detection (onsite)

14:55 – 15:10 Daniel Asfaw, Ivan Jordanov, Lawrence Impey, Ana Namburte, Raymond Lee and Antoniya Georgieva. Fetal Heart Rate Classification with Convolutional Neural Networks and the Effect of Gap Imputation on Their Performance (onsite)

15:10 – 15:25 Yasmen Wahba, Nazim Madhavji and John Steinbacher. A Comparison of SVM against Pre-trained Language Models (PLMs) for Text Classification (online)

15:25 – 15:40 Nicoletta Del Buono, Gaetano Settembre, Flavia Esposito, Nicola Corriero and Rosanna Rizzi. Machine learning approaches for predicting Crystal Systems: a brief review and a case study (online)

15:40 – 15:55 Lorenz Wendlinger, Michael Granitzer and Christofer Fellicious. Pooling Graph Convolutional Networks for Structural Performance Prediction (onsite)

15:55 – 16:10 Gabriel Turinici. Algorithms that get old : the case of generative deep neural networks (online)

Parallel Session 5 "Machine Learning for Fintech" (the first four talks)
Conference room 2: **Sala Veranda** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Giuseppe Di Fatta

14:40 – 14:55 Jiye Li, Bruno Kinder Almentero and Camille Besse. Explainable Machine Learning for Drug Shortage Prediction in a Pandemic Setting (onsite)

14:55 – 15:10 Aayush Kumar, Jimiama Mosima Mafeni Mase, Divish Rengasamy, Benjamin Rothwell, Mercedes Torres, David A. Winkler and Grazziela P. Figueredo. EFI: A Toolbox for Feature Importance Fusion and Interpretation in Python (onsite)

15:10 – 15:25 Stanislav Selitskiy and Natalya Selitskaya. Loss Function with Memory for Trustworthiness Threshold Learning: Case of Face and Facial Expression Recognition (onsite)

15:25 – 15:40 Alberto Zurli, Alessia Bertugli and Jacopo Credi. Does catastrophic forgetting negatively affect financial predictions? (online)

15:40 – 15:55 Phat Loi Tang, Thuy-Dung Le Pham and Tien Ba Dinh. Tree-based Credit Card Fraud Detection Using Isolation Forest, Spectral Residual, and Knowledge Graph (online)

15:55 – 16:10 Nicoletta Del Buono, Flavia Esposito, Grazia Gargano, Laura Selicato, Nicolò Taggio, Giulio Ceriola and Daniela Iasillo. Detecting anomalies in marine data: a framework for time series analysis (online)

Parallel Session 6
Conference room 3: **Sala Palio** (Zoom virtual room: LOD-ACAIN3)
Chair(s): Gabriele La Malfa

14:40 – 14:55 Jan Rauch and Petr Máša. Enhanced Association Rules and Python (online)

14:55 – 15:10 Bartłomiej Małkus and Grzegorz Nalepa. Forecasting daily cash flows in a company - shortcoming in the research field and solution exploration (online)

15:10 – 15:25 Anshul Rankawat, Rahul Kumar and Arun Kumar. Deep Recurrent Neural Networks for OYO Hotels Recommendation

15:25 – 15:40 Robin Fuchs, Denys Pommeret and Samuel Stocksieker. MI2AMI: Missing data imputation using Mixed Deep Gaussian Mixture Models (online TBC)

15:40 – 15:55 Emre Atan, Ali Duymaz, Funda Sarısözen, Uğur Aydın, Murat Koraş, Barış Akgün and Mehmet Gönen. Corporate Network Analysis Based on Graph Learning (online)

15:55 – 16:10 Filippo Velardocchia, Guido Perboli and Alessandro Vigliani. Analysis of heavy vehicles rollover with artificial intelligence techniques (online TBC)

16:10 – 16:40 Coffee Break

ACAIN Parallel Session 7
Conference room 1: **Sala Bracci** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giuseppe Di Fatta

16:40 – 16:55 Yuval Meir, Shiri Hodassman, Itamar Ben-Noam, Yael Tugendhaft, Amir Goldental, Roni Vardi and Ido Kanter. Brain-inspired neuronal silencing mechanism to enable high-precision sequence identification (onsite)

16:55 – 17:10 Joshua Böttcher, Tobias Schulte To Brinke, Abigail Morrison and Willem A. M. Wybo. Connectivity patterns that enable working memory in recurrent networks with dendritic subunits (onsite)

17:10 – 17:25 Mia-Katrin Kvalsund, Kyrre Glette and Frank Veenstra. Exploring the Effects of Centralized and Decentralized Control on Morphology and Performance (onsite)

17:25 – 17:40 David Lehký, Lukáš Novák and Drahomír Novák. Surrogate Modeling for Stochastic Assessment of Engineering Structures (onsite)

17:40 – 17:55 Lucia Billeci, Alessandro Tonacci and Maurizio Varanini. A machine learning approach for epileptic seizure prediction (online)

17:55 – 18:10 Angelo Lucia and Korkut Uygun. Monte Carlo Optimization of Liver Machine Perfusion Temperature Policies (online)

Parallel Session 8
Conference room 2: **Sala Veranda** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Emanuele La Malfa

16:40 – 16:55 Ruiqi Zhu, Xue Li, Fangrong Wang, Alan Bundy, Jeff Pan, Kwabena Nuamah, Stefano Mauceri and Lei Xu. TREAT: Automated Construction and Maintenance of Probabilistic Knowledge Bases from Logs

16:55 – 17:10 Florian Fiebig, Nikolaos Chrysanthidis, Anders Lansner and Pawel Herman. Synergistic short-term plasticity mechanisms for working memory

17:10 – 17:25 Sergio Lafuente-Arroyo, Saturnino Maldonado-Bascón, Diego Delgado-Mena, Juan Antonio Castro and Roberto Javier López-Sastre. Topological Robot Localization based on Visual Object Detection and Node Classification for indoor navigation (online TBC)

17:25 – 17:40 Kelly Smalenberger and Michael Smalenberger. Batch Bayesian Quadrature with Batch Updating Using Future Uncertainty Sampling

17:40 – 17:55 Xue Li, Alan Bundy, Ruiqi Zhu, Fangrong Wang, Stefano Mauceri, Lei Xu and Jeff Z. Pan. ABC in Root Cause Analysis: Discovering Missing Information and Repairing System Failures

17:55 – 18:10 Nikolaos Kyriakakis, Themistoklis Stamadianos, Magdalene Marinaki, Nikolaos Matsatsinis and Yannis Marinakis. A Bee Colony Optimization Approach for the Electric Vehicle Routing Problem with Drones (onsite)

18:10 – 18:20 Pause

Plenary Session
Conference room 1: **Sala Bracci** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giuseppe Di Fatta

18:20 – 20:05 ACAIN Tutorial Speaker:

Christina Kyrousi, *National and Kapodistrian Univeristy of Athens, Greece*
"Modelling brain development and disorders – organoids as a model system"
"Extrinsic and intrinsic mechanisms modulating human corticogenesis"

20:05 Dinner

Tuesday, September 20

Plenary Session
Conference room 1: **Sala Bracci** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giuseppe Nicosia & Giuseppe Di Fatta

09:00 – 09:45 ACAIN Lecture:
Karl Friston, *University College London, UK*
"Me and my Markov blanket"

09:45 – 10:30 ACAIN Lecture:
Karl Friston, *University College London, UK*
Second Lecture TBA

10:30 – 11:00 Tea & Coffee break

11:00 – 11:45 ACAIN Lecture:
Wulfram Gerstner, *EPFL, Switzerland*
"Eligibility traces and three-factor rules of synaptic plasticity: from reward to surprise"

11:45 – 12:30 ACAIN Lecture:
Wulfram Gerstner, *EPFL, Switzerland*
"No Backprop please! Learning hierarchical representations with neoHebbian learning rules"

12:30 – 13:15 ACAIN Lecture:
Michail Tsodyks, *Institute for Advanced Study, USA*
"Putative neuronal underpinnings of working memory"

13:15 – 14:40 Lunch

14:40 – 15:25 ACAIN Lecture:
Christos Papadimitriou, *Columbia Engineering, Columbia University, USA*
First Lecture "TBA"

15:25 – 16:10 ACAIN Lecture:
Christos Papadimitriou, *Columbia Engineering, Columbia University, USA*
Second Lecture "TBA"

16:10 – 16:40 Coffee Break

16:40 – 17:25 ACAIN Lecture:
Máté Lengyel, *Cambridge University, UK*
Lecture-1 "TBA"

ACAIN Parallel Session 9
Conference room 1: **Sala Bracci** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giovanni Giuffrida

17:25 – 17:40 José Diogo Marques dos Santos and José Paulo Marques dos Santos. Path Weights Analyzes in a Shallow Neural Network to Reach Explainable Artificial Intelligence (XAI) of fMRI Data (online)

17:40 – 17:55 Davide Borra, Matteo Filippini, Mauro Ursino, Patrizia Fattori and Elisa Magosso. A Bayesian-optimized Convolutional Neural Network to decode reach-to-grasp from macaque dorsomedial visual stream (online)

17:55 – 18:10 Naresh Balaji Ravichandran, Anders Lansner and Pawel Herman. Brain-like combination of feedforward and recurrent network components achieves prototype extraction and robust pattern recognition (online)

Parallel Session 10
Conference room 2: **Sala Veranda** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Emanuele La Malfa

17:25 – 17:40 Robert Jungnickel, Johanna Lauwigi, Vladimir Samsonov and Daniel Lütticke. Human-Centric Machine Learning Approach for Injection Mold Designers: Towards Automated Design of Ejector Pin Placement (onsite)

17:40 – 17:55 Jiye Li and Daniel Lafond. Hybrid human-AI forecasting for task duration estimation in ship refit (onsite)

17:55 – 18:10 Silvio Barra, Salvatore Carta, Antonello Meloni, Alessandro Sebastian Podda and Diego Reforgiato Recupero. A Practical Approach for Vehicle Speed Estimation in Smart Cities (online)

Parallel Session 11
Conference room 3: **Sala Palio** (Zoom virtual room: LOD-ACAIN3)
Chair(s): Gabriele La Malfa

17:25 – 17:40 Nadja Vater and Alfio Borzi. Preconditioned Gradient Method for Data Approximation with Shallow Neural Networks (onsite)

17:40 – 17:55 Christofer Fellicious, Lorenz Wendlinger and Michael Granitzer. Neural Network based Drift Detection (onsite)

17:55 – 18:10 Raphael Engelhardt, Moritz Lange, Laurenz Wiskott and Wolfgang Konen. Sample-based Rule Extraction for Explainable Reinforcement Learning (onsite)

18:10 – 18:20 Pause

ACAIN Parallel Session 12
Conference room 1: **Sala Bracci** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giuseppe Di Fatta

18:20 – 18:35 Daniel Taylor, Jonathan Shock, Deshendran Moodley, Jonathan Ipser and Matthias Treder. Brain Structural Saliency Over the Ages (onsite)

18:35 – 18:50 Mirco Milletarì, Sara Malvar, Yagna Oruganti, Leonardo Nunes, Yazeed Alaudah and Anirudh Badam. Source Attribution and Leak Quantification for Methane Emissions (online)

18:50 – 19:05 Dominika Michalkova, Mario Parra and Yashar Moshfeghi. Confidence As Part of Searcher's Cognitive Context (online)

19:05 – 19:20 Sakrapee Paisalnan, Yashar Moshfeghi and Frank Pollick. Neural Correlates of Satisfaction of an Information Need (online)

19:20 – 19:35 Fabian Schubert and Claudius Gros. Flow control: Local spectral radius regulation (online)

19:35 – 19:50 Kunjira Kingphai and Yashar Moshfeghi. On Time Series Cross-Validation for Deep Learning Classification Model of Mental Workload Levels Based on EEG Signals (onsite)

19:50 – 20:05 Marianna Ganapini, Murray Campbell, Francesco Fabiano, Lior Horesh, Jon Lenchner, Andrea Loreggia, Nicholas Mattei, Francesca Rossi, Biplav Srivastava and Kristen Brent Venable. Thinking Fast and Slow in AI: the Role of Metacognition (online)

Parallel Session 13
Conference room 2: **Sala Veranda** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Emanuele La Malfa

18:20 – 18:35 Rodica Ioana Lung and Mihai Suciu. A Game Theoretic Flavoured Decision Tree for Classification (onsite)

18:35 – 18:50 Francesca Strydom and Jacomine Grobler. Transformers for COVID-19 Misinformation Detection on Twitter: A South African Case Study (onsite)

18:50 – 19:05 Alessia Bertugli, Stefano Vincenzi, Simone Calderara and Andrea Passerini. Generalising via Meta-Examples for Continual Learning in the Wild (onsite)

19:05 – 19:20 Antonio Macaluso, Filippo Orazi, Matthias Klusch, Stefano Lodi and Claudio Sartori. A Variational Algorithm for Quantum Single Layer Perceptron (online)

19:20 – 19:35 Frederique van Leeuwen, Bas Bosma, Arjan van den Born and Eric Postma. Normalization in motif discovery (online)

19:35 – 19:50 Marco Reggiannini, João Janeiro, Flávio Martins, Oscar Papini and Gabriele Pieri. Mesoscale events classification in SST imagery (online)

19:50 – 20:05 Sung-Eun Jang, Kyeonah Yu and Juntae Kim. Introducing Prototype Nodes in EGNN for Few-Shot Learning (onsite)

Parallel Session 14 "Machine Learning and Causal Inference for Economic Applications"
Conference room 3: **Sala Palio** (Zoom virtual room: LOD-ACAIN3)
Chair(s): Giorgio Gnecco

18:20 – 18:35 Ana Boskovic and Marco Gross. Helping the Oracle: Vector Sign Constraints in Model Shrinkage Methodologies (onsite)

18:35 – 18:50 Francesco Biancalani, Giorgio Gnecco, Rodolfo Metulini and Massimo Riccaboni. Matrix completion for the prediction of yearly country and industry-level CO_2 emissions (onsite)

18:50 – 19:05 Iulia Igescu. Capturing Self Fulfilling Beliefs in a Rare Event (onsite)

19:05 – 19:20 Fabio Incerti, Falco Joannes Bargagli-Stoffi and Massimo Riccaboni. A Two-Country Study of Default Risk Prediction using Bayesian Machine-Learning (online)

19:20 – 19:35 Philip Stahmann, Maximilian Nebel and Bodo Rieger. A Real-Time Semantic Anomaly Labeler Capturing Local Data Stream Features to Distinguish Anomaly Types in Production (online)

19:35 – 19:50 Yael Tugendhaft, Roni Vardi, Yuval Meir, Shiri Hodassman, Amir Goldental and Ido Kanter. Brain experiments imply adaptation mechanisms which outperform common AI learning algorithms (online)

19:50 – 20:05 Nathan Wiseman. Brain-Computer Interfaces and Interactive Virtual Environments in VR - Recent Applications and Future Prospects (online)

20:05 Dinner

Wednesday, September 21

Plenary Session
Conference room 1: **Sala Bracci** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giuseppe Nicosia & Giuseppe Di Fatta

09:00 – 09:45 ACAIN Lecture:
Michail Tsodyks, *Institute for Advanced Study, USA*
"Mathematical models of human memory

09:45 – 10:30 ACAIN Lecture:
Máté Lengyel, *Cambridge University, UK*
Lecture 2 "TBA"

10:30 – 11:00 Coffee break

11:00 – 11:45 ACAIN Lecture:
Panos Pardalos, *University of Florida, USA*
"Networks (and Data Science) in Brain Research"

ACAIN Parallel Session 15
Conference room 1: **Sala Bracci** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giovanni Giuffrida

11:45 – 12:00 Costanza Cenerini, Luca Vollero, Giorgio Pennazza, Marco Santonico and Flavio Keller. Audio Visual Association test in non synesthetic subjects: Technological Tailoring of the methods (onsite)

12:00 – 12:15 Karolina Armonaite, Marco Balsi, Livio Conti and Franca Tecchio. How spectral and fractal analyses of neurodynamics reveal the signature of cortical areas in waking and sleeping states: a study of Montreal Neurological Institute intracranial sEEGs (onsite)

12:15 – 12:30 Zuzana Pinkosova, William McGeown and Yashar Moshfeghi. Revisiting Neurological Aspects of Relevance: An EEG Study (onsite)

12:30 – 12:45 Shiri Hodassman, Roni Vardi, Yael Tugendhaft, Amir Goldental and Ido Kanter. Efficient dendritic learning as an alternative to synaptic plasticity hypothesis (online)

12:45 – 13:00 Zenon Lamprou, Frank Pollick and Yashar Moshfeghi. Role of Punctuation in Semantic Mapping between Brain and Transformer Models (online)

13:00 – 13:15 Liu Zhang, Fei Han and Kelin Xia. Topology-based Comparison of Neural Population Responses via Persistent Homology and p-Wasserstein Distance (online)

Parallel Session 16
Conference room 2: **Sala Veranda** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Emanuele La Malfa

11:45 – 12:00 Hafez Ghaemi, Erfan Mirzaei, Mahbod Nouri and Saeed Reza Kheradpisheh. BioLCNet: Reward-modulated Locally Connected Spiking Neural Networks (onsite)

12:00 – 12:15 Alessandro Guazzo, Enrico Longato, Gian Paolo Fadini, Mario Luca Morieri, Giovanni Sparacino and Barbara Di Camillo. Explainable Deep-Learning Model Reveals Past Cardiovascular Disease in Patients with Diabetes Using Free-Form Visit Reports (onsite)

12:15 – 12:30 Lukáš Novák, David Lehký and Drahomír Novák. Sensitivity analysis of Engineering Structures Utilizing Artificial Neural Networks and Polynomial Chaos Expansion (onsite)

12:30 – 12:45 Bruno Giovanni Galuzzi, Luca Milazzo and Chiara Damiani. Best practices in flux sampling of constrained-based models (online)

12:45 – 13:00 Marzieh Soleimanpoor, Milad Mokhtaridoost and Mehmet Gönen. A Kernel-Based Multilayer Perceptron Framework to Identify Pathways Related to Cancer Stages (online)

13:00 – 13:15 Yannick Smit, Floris den Hengst, Sandjai Bhulai and Ehsan Mehdad. Strategic Workforce Planning with Deep Reinforcement Learning (online)

13:15 – 14:40 Lunch

15:00 Social Tour: Guided Visit of Siena

20:05 Dinner

Thursday, September 22

Plenary Session

Conference room 1: **Sala Bracci** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giuseppe Di Fatta

09:00 – 9:45 LOD Lecture:
Panos Pardalos, *University of Florida, USA*
"Computational Approaches for Solving Systems of Nonlinear Equations"

09:45 – 10:30 ACAIN Tutorial Speaker:
Christina Kyrousi, *National and Kapodistrian Univeristy of Athens, Greece*
"TBA"

10:30 – 11:00 Coffee break

Parallel Session 17

Conference room 1: **Sala Bracci** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Gabriele La Malfa

11:00 – 11:15 Rema Padman, Daniel Gartner and Yiye Zhang. Physical and Cognitive Workload Reduction in Clinical Information Systems using Optimization and Machine Learning (onsite)

11:15 – 11:30 Yutong Li, Xiaorui Xu and Sophia Tsoka. A Matrix Factorization-based Drug-virus Link Prediction Method for SARS-CoV-2 Drug Prioritization (onsite)

11:30 – 11:45 Rommel Regis. Hyperparameter Tuning of Random Forests Using Radial Basis Function Models (online)

11:45 – 12:00 Luana Bulla, Stefano De Giorgis, Aldo Gangemi, Ludovica Marinucci and Misael Mongiovì. Detection of Morality in Tweets based on the Moral Foundation Theory (online)

12:00 – 12:15 Ernestas Filatovas, Povilas Gudžius, Vytenis Darulis and Olga Kurasova. Convolutional Neural Networks and Neural Architecture Search for Satellite Imagery Analysis (online)

12:15 – 12:30 Hannes Fassold. AdaFamily: A family of Adam-like adaptive gradient methods (online)

12:30 – 12:45 Sanae Lotfi, Tiphaine Bonniot de Ruisselet, Dominique Orban and Andrea Lodi. Adaptive First- and Second-Order Algorithms for Large-Scale Machine (online)

12:45 – 13:00 Jaqueline Alvarenga Silveira, Sérgio Adorno, Marcelo Batista Nery, Germain García, Afonso Paiva and Luis Gustavo Nonato. São Paulo City Homicides and Their Surroundings: from Non-Negative Tensor Factorization to Pattern Identification (online)

13:00 – 13:15 Antonio Mariani, Italo Epicoco, Massimo Cafaro and Marco Pulimeno. Grid-based Contraction Clustering in a Peer-to-Peer Network (online)

13:15 – 13:30 Manuel Berkemeier. A Derivative-Free Trust Region Algorithm with Filter for Non- linear Constraints in Multiobjective Optimization (online)

13:30 **Concluding**

Parallel Session 18
Conference room 2: **Sala Veranda** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Emanuele La Malfa

11:00 – 11:15 João Braz Simões, Ernesto Costa, Rui Travasso and Tiago Baptista. Generating Vascular Networks: a Reinforcement Learning Approach (onsite)

11:15 – 11:30 Chesoong Kim. Modeling and optimization for retrial queuing networks with an arbitrary topology and multi-server nodes (onsite TBC)

11:30 – 11:45 Jörg Martin and Clemens Elster. Aleatoric uncertainty for Errors-in-Variables models in deep regression

11:45 – 12:00 Jayadeep Anil Shitole, Ajinkya More and Karthick Gopalswamy. Prepack Optimization to Fulfil Heterogeneous Demand across a Network of Stores

12:00 – 12:15 Sangeeta Yadav. Data Driven Stabilization Scheme

12:15 – 12:30 Vanya Aziz, Ivo Nowak and Ouyang Wu. Decolearn: A Framework for Decomposition-Based Machine Learning

12:30 – 12:45 Konstantin Heinrich Sonntag and Sebastian Peitz. Accelerated Multiobjective Optimization Algorithms motivated by Inertial Gradient-like Dynamical Systems

12:45 – 13:00 Cristinca Fulga. Stochastic Programming Model for Supply Chains Activities with Integration of Reverse Logistics

13:00 – 13:15 Ashhadul Islam and Samir Belhaouari. Smart Pruning of Deep Neural Networks using curve fitting and evolution of weights

13:15 – 13:30 Kiran Chhatre, Sidney Feygin, Colin Sheppard and Rashid Waraich. Parallel Bayesian Optimization of Agent-based Transportation Simulation

13:30 – 15:00 Lunch

15:00 – 16:15 Free Time

16:15 Guided Visit of the Certosa di Pontignano and Wine Tasting

20:05 **Social Dinner***

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Up there, in fact, the wind turns into the planet's enigmatic breathing. The morning breeze blows out toward the sea and returns warmer in the evening toward land.

In that oasis which welcomes my exodus I sense the idleness of old men, I listen to the dull, mounting din of birds breaking into song, to silence, to the cry of joy that greets the day, to the sounds of life in the valley that are deflected, with the clinking of artisans meeting the moans of plows furrowing the land.

Then there is that silence which is "not silent", being the language of nature and the universe. Not only – it is also an ongoing locution that we risk interrupting with our sudden, fragmented comments.

And so, in this refuge of solitude, as the day takes leave for men and all life, abandoning the hollows of the hills and eclipsing among the crevices of arid mounds, the soul is filled with nostalgia for loved ones and contact with the human world: because it is precisely in isolation that wholeness may be best appreciated.

The heart passes from a state of melancholy to one of universal generosity that is born of an acute perception of the frailty of humanity, life and beauty – of all that is hoped for and promised.

Mario Luzi, from "*Terra di vento e di deserto*" in *Mi guarda Siena.*

… Pausa di privilegio alla mia traversata – sosta che l'animo in accelerazioni di slanci desidera smanioso e quasi ingordo – è la terra orciana, quella più alta, oltre San Quirico, fino a Montepulciano, a Pienza.

Visione che appare come un fondale della memoria o un luogo del sogno su cui un oscuro senso esaltato percepisce il brivido d'una misteriosa ventilazione.

Lassù, infatti, il vento è una specie di respiro misterioso del pianeta. Vi soffia la brezza che la mattina corre in direzione del mare e che a sera ritorna, più calda, verso terra.

Da quell'oasi che si apre accogliente al mio esodo, intuisco l'ozio dei vegliardi, ascolto l'ascesa del fragore sordo e chioccio degli uccelli verso il canto, il silenzio, il grido di felicità che colma il giorno, l'operosità della valle che rimbalza e si risponde in opere artigiane, in mugli di motori spinti al solco delle arature.

E ancora… un silenzio "non silenzioso", in quanto voce e linguaggio della natura, dell'universo. Anzi, di più: un discorso continuo, sempre in atto, che, in verità, a volte noi interrompiamo con un dire frammentario e provvisorio.

Così, nella mia nicchia di solitudine, mentre il giorno umano e non umano sfugge dalla terra, dall'incavo dei suoi piccoli monti e si eclissa tra le pieghe dei suoi aridi dossi, l'animo elabora anche una nostalgia dei propri simili, del contatto con il mondo degli uomini: perché è nella separatezza che viene rivalutata la totalità.

Il cuore, da una condizione di malinconia, deborda, allora, ad una "carità" universale che nasce dal senso acuto della fragilità umana, della vita, della bellezza. E tutto ciò è attesa, promessa.

Mario Luzi, *da "Terra di vento e di deserto" in Mi guarda Siena* *.