LOD & ACAIN 2021

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

Grasmere, Lake District, England, UK

LOD2021

7th International Conference on machine Learning, Optimization & Data science – LOD 2021
OCTOBER 4 – 8 2021

ACAIN 2021

1st International Advanced Course & Symposium on Artificial Intelligence & Neuroscience – ACAIN 2021
OCTOBER 5 – 8 2021

7th International Conference on machine Learning, Optimization & Data science – LOD 2021
October 4 – 8, 2021
https://lod2021.icas.cc
lod@icas.cc
and
1st International Advanced Course & Symposium on Artificial Intelligence & Neuroscience – ACAIN 2021
October 5 – 8, 2021
https://acain2021.artificial-intelligence-sas.org
acain@icas.cc

A Conference, a Course, and a Symposium in a Unique Event
Wordsworth Hotel & Spa – Grasmere, Lake District, England, UK

Program Ver. 6, 22 pages – This schedule is tentative and subject to change.
Time Zone: BST British Summer Time (UTC +1), London, England, UK

Time (BST)	**Monday October 4**	**Tuesday October 5**	**Wednesday October 6**	**Thursday October 7**	**Friday October 8**
07:30 – 08:30		Breakfast in your hotel			
08:30 – 09:00		Arrival tea, freshly brewed coffee, and homemade biscuits [Conference rooms]			
09:00 – 09:45		Karl Friston	Rosalyn Moran	Roberto Cipolla	Panos Pardalos
09:45 – 10:30		Matthew Botvinick	Maneesh Sahani	Ioannis Antonoglou	Verena Rieser
10:30 – 11:00		Tea & Coffee break	Tea & Coffee break	Tea & Coffee break	Tea & Coffee break
11:00 – 11:45		Jane Wang	Maneesh Sahani	ACAIN/LOD Sessions 11 & 12	LOD Sessions 15 & 16
11:45 – 12:30	Arrival tea, freshly brewed coffee, and homemade biscuits & **Registration**	Karl Friston	ACAIN Session 9 & LOD Session 10		
12:30 – 14:00		Lunch	Lunch	Lunch	Lunch
14:00 – 14:45		Claudia Clopath	Gentle Walk Grasmere Lake* + Free Time	Moderate Walk Alcock Tarn* + Free Time	LOD Sessions 17 & 18
14:45 – 15:30	**Opening** LOD Sessions 1 & 2	Timothy Behrens			
15:30 – 16:15		Rosalyn Moran			
16:15 – 16:45	Afternoon Tea	Afternoon Tea			Afternoon Tea
16:45 – 17:30	LOD Sessions 3 & 4	Ila Fiete			ACAIN/LOD Sessions 19 & 20 Closing
17:30 – 18:30		ACAIN/LOD Sessions 5 & 6			
18:30 – 20:00	Dinner in your hotel	Dinner	Dinner	Dinner	Gala Dinner** (19:00 – 21:00)
20:00 – 21:00	Thomas Viehmann Tea	Thomas Viehmann	Ila Fiete	Tea ACAIN/LOD Sessions 13 & 14	
21:00 – 21:45		Tea ACAIN/LOD Sessions 7 & 8	Tea James Whittington		

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

Parallel Sessions:
Conference room 1: *onsite* **Coleridge Suite** (and *online* Zoom virtual room n. 1: LOD-ACAIN1 "Coleridge Suite")
Conference room 2: *onsite* **The Lounge** (and *online* Zoom virtual room n. 2: LOD-ACAIN2 "The Lounge")

Arrival for LOD 2021 Attendees: *Sunday, October 3*
Arrival for ACAIN 2021Attendees: *Monday, October 4*

Departure: *Saturday, October 9*

Registration: *Monday October 4 (11:45-14:45)*
The registration desk will be located in the Wordsworth Hotel Reception/Lounge. Upon registration at the desk, you will receive your badge, voucher(s), and conference material(s). To facilitate the process, please bring your registration confirmation. You are kindly requested to wear your name badge during all events of the conference.

Walk*

What to wear for walking in the Lake District Fells?

- **Waterproof jackets and waterproof over-trousers** Always be prepared for a sudden change in the forecast.
- **Insulating and breathable layers** It's easy to cool down quickly while stopping on a walk so pack an extra layer just in case.
- **Comfortable trousers** Avoid fabrics which might take time to dry out if they get wet, such as cotton and denim.
- **Hat and gloves** Even in summer, we recommend you keep these in your rucksack.
- **Walking boots** We recommend boots rather than walking shoes as a boot offers ankle protection. Always make sure your footwear has a good tread or sole pattern. There are different types of footwear available for summer and winter walking, so do check before you trek. *Please note that on many of our guided walk routes, walking boots are essential***.**
- **Walking socks** A good breathable pair will help keep feet warm, cosy, and comfy.

What to bring with you on a walk?

- **Comfortable day sack or rucksack** Adjusted to fit you and a size to suit the walk.
- **Walking poles** Poles can help you maintain a good balance and reduce stress on knees and backs. Be sure to know how to use them.
- **Gaiters** Not essential but useful if you want to keep your trousers and feet dry.
- **Food, water, and a warm drink** There is little shelter on the fell tops so check the forecast and bring what you need to keep hydrated and your energy levels up.
- **Emergency food** Keep a high energy snack stashed in your pack.
- **Mobile phone** (fully charged) or a watch to keep an eye on the time.
- **Sun protection** Protect your skin and eyes.
- **Map and compass** Be sure to know how to use these. Your **GPS** might not work. We offer fun, informal basic navigation courses.
- **Whistle and torch** Remember the international distress signal: six short whistle blasts or flashes with your torch, repeated at one-minute intervals.

https://www.lakedistrict.gov.uk/visiting/things-to-do/walking/top-walking-tips

Gentle Walk around Grasmere Lake, 3 ½ miles, approximately 2 – 2 ½ hours.

One of Lakeland's Classic Walks – A circular tour around the shoreline of a tranquil lake, set in the heart of a beautiful valley.

Suitable for all weather conditions.

Halfway through the tour we will take a break (20 minutes) with a snack (e.g., prosecco, a piece of cake, sandwich).

Moderate Walk: Alcock Tarn, 3 ½ miles, approximately 3 hours.

A steep bur rewarding climb, with stunning views across the whole Grasmere Valley, set amidst a seemingly never-ending vista of lakes and mountains.

Upon reaching the summit, we will take a break (20 minutes) with a snack (e.g., prosecco, a piece of cake, sandwich).

Gala 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 ionela.oanea@thewordsworthhotel.co.uk AND lod@icas.cc AND acain@icas.cc thanks.

Lunches and dinners will be served in the Signature Restaurant.

Morning and afternoon coffee/tea breaks will be served in the Bar and Conservatory.

LOD 2021 Keynote Speakers

Ioannis Antonoglou, DeepMind, London, UK
"MuZero - Mastering Atari, Go, Chess and Shogi by Planning with a Learned Model"

Roberto Cipolla, University of Cambridge, UK
"Computer Vision: Geometry, Uncertainty and Deep Learning"

Panos Pardalos, University of Florida, UK
"Artificial Intelligence in Biomedicine"

Verena Rieser, Heriot Watt University, UK
"Advances and Challenges in Conversational AI"

LOD 2021 Tutorial Speaker

Thomas Viehmann, MathInf GmbH, Germany
"Introduction to PyTorch"

Past LOD Keynote Speakers

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*
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*
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 2021 Lecturers

Timothy Behrens, Nuffield Department of Clinical Neurosciences, University of Oxford, UK
Lecture: "Representing the structure of problems in the frontal hippocampal circuitry"

Matthew Botvinick, DeepMind, London, UK & Gatsby Computational Neuroscience Unit, UCL, UK
Lecture: "Deep reinforcement learning and its neuroscientific implications"

Claudia Clopath, Computational Neuroscience Lab, Dept. of Bioengineering, Imperial College London, UK
Lecture: "Modelling learning in the brain"

Ila Fiete, Dept. of Brain and Cognitive Sciences MIT, USA
Lecture 1: "Neural circuits for navigation and cognitive mapping: Invariance, stability and flexibility"
Lecture 2: "Learning rules and bottom-up constraints for learning in neuroscience"

Karl Friston, Institute of Neurology, University College London, UK & Wellcome Trust Centre for Neuroimaging
Lecture 1: "I am therefore I think"
Lecture 2: "Active inference and belief propagation in the brain"

Rosalyn Moran, Department of Neuroimaging, King's College London, UK
Lecture 1: "Active Inference, Case Studies on Neurobiology and Cognition"
Lecture 2: "Active Inference, Case Studies on a Neurobiologically Informed AI"

Maneesh Sahani, Gatsby Computational Neuroscience Unit, University College London, UK
*Lecture 1: "*Evidence for Inference*"*
Lecture 2: "(Circuits for) Inference of Evidence*"*

Jane Wang, DeepMind, London, UK
Lecture: "Meta-learning task structure in humans and machines"

ACAIN 2021 Tutorial Speaker

James C.R. Whittington, University of Oxford, UK
Tutorial: "How to build a cognitive map: insights from models of the hippocampal formation"

LOD & ACAIN 2021 Programme

Monday, October 4

11:45 – 14:45 Registration & Arrival tea, freshly brewed coffee and homemade biscuits

LOD Session 1
Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Varun Ojha

14:45 – 15:00 (Plenary Session) **Opening: Giuseppe Nicosia & Panos Pardalos.**

15:00 – 15:15 *Go to Youtube and Call me in the Morning: use of Social Media for Chronic conditions*, Rema Padman, Xiao Liu, Anjana Susarla & Bin Zhang (Onsite)

15:15 – 15:30 *Smart Agents for Machine Perfusion*, Angelo Lucia, Emily Ferrarese, Korkut Uygun & Ioannis Androulakis, (Screen sharing)

15:30 – 15:45 *A Sobolev space viewpoint on the benign overfitting phenomenon for fully connected Deep Nets*, Stephane Chretien & Emmanuel Caron (Screen sharing)

15:45 – 16:00 *CURNet: Deep Learning Based Multi-Step Fault Prediction on High Dimensional Unbalanced Data*, Hang Ruan (Screen sharing)

16:00 – 16:15 *Using machine learning to predict the number of alternative solutions to a minimum cardinality set covering problem*, Brooks Emerick, Francis Vasko & Yun Lu. (Screen sharing)

LOD Session 2
Conference room 2: **The Lounge** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Emanuele La Malfa

15:00 – 15:15 *Automation-driven innovation management? Toward Innovation-Automation-Strategy cycle*, Piotr Makowski & Yuya Kajikawa (Onsite)

15:15 – 15:30 *Statistical Estimation of Quantization for Probability Distributions: Best Equivariant Estimator of Principal Points*, Shun Matsuura & Hiroshi Kurata (screen sharing)

15:30 – 15:45 *On Accelerating Decomposition Algorithms Using Surrogate Models*, Ouyang Wu & Ivo Nowak (Screen sharing)

15:45 – 16:00 *Gaussian Mixture Model Decision Tree for Classification*, Aditya Sivanand, Joerg Fliege, Erengul Dodd & Ralf Werner (Screen sharing)

16:00 – 16:15 *Explainable Graph Attention Networks*, David Pham and Yongfeng Zhang (Screen sharing)

16:15 – 16:45 Afternoon Tea

LOD Session 3
Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Varun Ojha

16:45 – 17:00 Cascaded Classifier for Pareto-Optimal Accuracy-Cost Trade-Off Using off-the-Shelf ANNs, Cecilia Latotzke, Johnson Loh &Tobias Gemmeke (Onsite)

17:00 – 17:15 SDF-GAN: Aerofoil shape parameterisation via an adversarial auto-encoder, Tom Bamford, Andy Keane & David Toal (Onsite)

17:15 – 17:30 Optimally Weighted Ensembles for Efficient Multi-Objective Optimization, Gideon Hanse, Roy de Winter, Bas van Stein & Thomas Bäck (Onsite)

17:30 – 17:45 ODIN: pluggable meta-annotations and metrics for the diagnosis of classification and localization, Rocio Torres, Federico Milani & Piero Fraternali (Onsite)

17:45 – 18:00 *Leverage Score Sampling for Complete Mode Coverage in Generative Adversarial Networks*, Joachim Schreurs, Hannes De Meulemeester, Michael Fanuel, Bart De Moor & Johan Suykens (Onsite)

18:00 – 18:15 *Distilling Financial Models by Symbolic Regression*, Gabriele La Malfa, Emanuele La Malfa, Roman Belavkin, Panos M. Pardalos & Giuseppe Nicosia (Onsite)

18:15 – 18:30 *Fast ABC with joint generative modelling and subset simulation*, Eliane Maalouf, David Ginsbourger & Niklas Linde (Screen sharing)

LOD Session 4
Conference room 2: **The Lounge** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Alberto Castellini

16:45 – 17:00 *A Hybrid Surrogate-Assisted Accelerated Random Search and Trust Region Approach for Constrained Black-Box Optimization*, Rommel Regis (screen sharing)

17:00 – 17:15 *Neural Weighted A*: Learning Graph Costs and Heuristics with Differentiable Anytime A**, Alberto Archetti, Marco Cannici & Matteo Matteucci (screen sharing)

17:15 – 17:30 *Randomized Iterative Methods for Matrix Approximation*, Allan Struthers, Benjamin Ong & Joy Azzam (screen)

17:30 – 17:45 *Dissecting FLOPs along input dimensions for GreenAI cost estimations*, Andrea Asperti, Davide Evangelista & Moreno Marzolla (Video)

17:45 – 18:00 *Public Transport Arrival Time Prediction based on GTFS data*, Eva Chondrodima, Harris Georgiou, Nikos Pelekis & Yannis Theodoridis (screen sharing)

18:00 – 18:15 *Machine Learning in a Policy Support System for Smart Tourism Management*, Elena Bellodi, Riccardo Zese & Francesco Bertasi (Screen sharing)

18:15 – 18:30 *Activity Imputation of Shared e-Bikes Travels in Urban Areas*, Natalia Selini Hadjidimitriou, Marco Lippi & Marco Mamei (Video)

Dinner in your hotel

LOD Tutorial
Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giuseppe Nicosia

20:00 – 22:00 **LOD Tutorial: Thomas Viehmann, MathInf GmbH, Germany**
"Introduction to PyTorch – Part 1"

Tuesday, October 5

08:30 – 09:00 Arrival tea, freshly brewed coffee and homemade biscuits

Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1) Plenary Session
Chair(s): Giuseppe Nicosia

09:00 – 09:45 **ACAIN Lecture: Karl Friston, Institute of Neurology, University College London, UK**
"I am therefore I think"

09:45 – 10:30 **ACAIN Lecture: Matthew Botvinick, DeepMind & University College London, UK**
"Deep reinforcement learning and its neuroscientific implications"

10:30 – 11:00 Tea & Coffee break

11:00 – 11:45 **ACAIN Lecture: Jane Wang, DeepMind, London, UK**
"Meta-learning task structure in humans and machines"

11:45 – 12:30 **ACAIN Lecture: Karl Friston, Institute of Neurology, UCL, UK**
"Active inference and belief propagation in the brain"

12:30 – 14:00 Lunch

14:00 – 14:45 **ACAIN Lecture: Claudia Clopath, Imperial College London, UK**
"Modelling learning in the brain"

14:45 – 15:30 **ACAIN Lecture: Timothy Behrens, University of Oxford, UK**
"Representing the structure of problems in the frontal hippocampal circuitry"

15:30 – 16:15 **ACAIN Lecture: Rosalyn Moran, King's College London, UK**
"Active Inference, Case Studies on Neurobiology and Cognition"

16:15 – 16:45 Afternoon Tea

16:45 – 17:30 **ACAIN Lecture: Ila Fiete, MIT, USA**
Lecture 1: "Neural circuits for navigation and cognitive mapping: Invariance, stability and flexibility"

ACAIN Session 5
Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giovanni Giuffrida

17:30 – 17:52 *Effect of Geometric Complexity on Intuitive Model Selection*, Eugenio Piasini, Vijay Balasubramanian & Joshua Gold (Screen Sharing)

17:52 – 18:14 *Training Convolutional Neural Networks with Competitive Hebbian Learning Approaches*, Gabriele Lagani, Giuseppe Amato, Fabrizio Falchi & Claudio Gennaro (Onsite)

(more on next page)

18:14 – 18:36 *Cortical feedback loops bind distributed high-dimensional representations of working memory*, Ivan Voitov & Thomas Mrsic-Flogel (Onsite)

LOD Session 6
Conference room 2: **The Lounge** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Emanuele La Malfa

17:30 – 17:45 *Evaluating Hebbian Learning in a Semi-Supervised Setting*, Gabriele Lagani, Fabrizio Falchi, Claudio Gennaro & Giuseppe Amato (Onsite)

17:45 – 18:00 *A Large Visual Question Answering Dataset for Cultural Heritage*, Luigi Asprino, Luana Bulla, Ludovica Marinucci, Misael Mongiovì & Valentina Presutti (screen sharing)

18:00 – 18:15 *Analyzing Communication Broadcasting in the Digital Space*, Giovanni Giuffrida, Andrea Russo & Francesco Mazzeo Rinaldi (Onsite)

18:15 – 18:30 *Can you tell? SSNet - a Biologically-inspired Neural Network Framework for Sentiment Classifiers*, Apostol Vassilev, Munawar Hasan & Honglan Jin (Video)

18:36 – 20:00 Dinner

LOD Tutorial
Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giuseppe Nicosia
20:00 – 21:00 **LOD Tutorial: Thomas Viehmann, MathInf GmbH, Germany**
"Introduction to PyTorch – Part 2"

ACAIN Session 7 & Tea
Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giovanni Giuffrida

21:00 – 21:22 *Credit Assignment in Neural Networks through Deep Feedback Control*, Alexander Meulemans, Matilde Tristany Farinha, Javier Garcia Ordonez, Pau Vilimelis Aceituno, Joao Sacramento & Benjamin Grewe (Onsite)

21:22 – 21:44 *Dynamic causal communication channels between neocortical areas*, Mitra Javadzadeh & Sonja B. Hofer (Onsite)

21:44 – 21:59 *Linear regression trees for steelmaking recommendations*, Nikolai Kniazev (screen sharing)

LOD Session 8 & Tea
Conference room 2: **The Lounge** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Gabriele La Malfa

21:00 – 21:15 *Using Statistical and Artificial Neural Networks Meta-learning Approaches for Uncertainty Isolation in Face Recognition by the Established Convolutional Models*, Stanislav Selitskiy, Nikolaos Christou & Natalya Selitskaya (screen sharing)

21:15 – 21:30 *Predatory Conversation Detection using Transfer Learning approach*, Nancy Agarwal, Mudasir Ahmad Wani, Tuçe Ünlü & Patrick Bours (screen sharing)

21:30 – 21:45 *Epicentral Region Estimation using Convolutional Neural Networks*, Leonel Cruz, Rubén Tous, Beatriz Otero, Leonardo Alvarado, Sergi Mus & Otilio Rojas (screen sharing)

21:45 – 22:00 *Conditional Generative Adversarial Networks for Speed Control in Trajectory Simulation*, Sahib Julka, Vishal Sowrirajan, Joerg Schloetterer & Michael Granitzer (screen sharing)

Wednesday, October 6

08:30 – 09:00 Arrival tea, freshly brewed coffee and homemade biscuits

Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1) Plenary Session
Chair(s): Giuseppe Nicosia

09:00 – 09:45 **ACAIN Lecture: Rosalyn Moran, King's College London, UK**
"Active Inference, Case Studies on a Neurobiologically Informed AI"

09:45 – 10:30 **ACAIN Lecture: Maneesh Sahani, University College London, UK**
"Evidence for Inference"

10:30 – 11:00 Tea & Coffee break

ACAIN Lecture
Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giuseppe Nicosia

11:00 – 11:45 **ACAIN Lecture: Maneesh Sahani, University College London, UK**
"(Circuits for) Inference of Evidence"

ACAIN/LOD Session 9
Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Varun Ojha

11:45 – 12:07 *Cortical oscillations support sampling-based computations in spiking neural networks*, Agnes Korcsak-Gorzo, Michael Günther Müller, Andreas Baumbach, Leng Luziwei, Oliver Julien Breitwieser, Sacha Jennifer van Albada, Walter Senn, Karlheinz Meier, Robert Legenstein & Mihai Alexandru Petrovici (screen sharing)

12:07 – 12:29 *Learning Bayes-optimal dendritic opinion pooling*, Jakob Jordan, João Sacramento, Willem A.M. Wybo, Mihai A. Petrovici & Walter Senn (Onsite)

12:29 – 12:51 *An Optimization method for Accurate Nonparametric Regressions on Stiefel Manifolds*, Chafik Samir & Ines Adouani (screen sharing)

LOD Session 10
Conference room 2: **The Lounge** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Gabriele La Malfa

11:45 – 11:55 *Neuropathological Assessments of Dementia Using Machine Learning Feature Selection*, Mohammed Rajab, Emmanuel Jammeh, Teruka Taketa, Carol Brayne, Fiona E Matthews, Paul G Ince, Li Su, Stephen B Wharton, Dennis Wang & On Behalf Of The Cognitive Function And Ageing Neuropathology Study Group. (Onsite)

11:55 – 12:05 *Pushing the Limits of Astrophysical Light Curve Processing with Physics-Based Probabilistic Neural Networks*, Mario Morvan, Angelos Tsiaras, Nikolaos Nikolaou & Ingo Waldmann. (Onsite)

(more on next page)

12:05 – 12:20 *Unsupervised PulseNet: Automated Pruning of Convolutional Neural Networks by K-Means Clustering*, David gore, Michael Giering & Steve Prestwich (screen sharing)

12:20 – 12:35 *Topological properties of mouse neuronal populations in fluorescence microscopy images*, Margarita Zaleshina & Alexander Zaleshin (video)

12:35 – 14:00 Lunch

14:00 – 18:30 **Gentle Walk around Grasmere Lake* + Free Time**

18:30 – 20:00 Dinner

ACAIN Lecture and Tutorial & Tea
Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giuseppe Nicosia

20:00 – 21:00 **ACAIN Lecture: Ila Fiete, MIT, USA**
"Learning rules and bottom-up constraints for learning in neuroscience"

21:00 – 21:45 **ACAIN Tutorial: James Whittington, University of Oxford, UK**
"How to build a cognitive map: insights from models of the hippocampal formation"

Thursday, October 7

08:30 – 09:00 Arrival tea, freshly brewed coffee and homemade biscuits

Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1) Plenary Session
Chair(s): Giuseppe Nicosia

09:00 – 09:45 **LOD Keynote Speaker: Roberto Cipolla, University of Cambridge, UK**
"Computer Vision: Geometry, Uncertainty and Deep Learning"

09:45 – 10:30 **LOD Keynote Speaker: Ioannis Antonoglou, DeepMind, London, UK**
"MuZero - Mastering Atari, Go, Chess and Shogi by Planning with a Learned Model"

10:30 – 11:00 Tea & Coffee break

ACAIN Session 11
Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Giovanni Giuffrida

11:00 – 11:22 *Cortico-cerebellar networks as brain-wide decoupling machines*, Joseph Pemberton, Ellen Boven, Richard Apps & Rui Ponte Costa (Onsite)

11:22 – 11:44 *Hippocampal encoding of continual reinforcement learning features*, Samia Mohinta, Dabal Pedamonti, Stephane Ciocchi & Rui Ponte Costa (Onsite)

11:44 – 12:06 *A contrastive rule for meta-learning*, Nicolas Zucchet, Simon Schug, Johannes von Oswald, Dominic Zhao & João Sacramento (Onsite)

12:06 – 12:28 *Evolving to Learn: Automating the search for interpretable, biologically plausible synaptic plasticity rules*, Henrik Daniel Mettler, Maximilian Schmidt, Walter Senn, Mihai Alexandru Petrovici & Jakob Jordan (Onsite)

LOD Session 12
Conference room 2: **The Lounge** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Emanuele La Malfa

11:00 – 11:15 *Predicting Worst-Case Execution Times During Multi-Criterial Function Inlining*, Kateryna Muts & Heiko Falk (screen sharing)

11:15 – 11:30 *Deep autonomous agents comparison for self-driving cars*, Alessandro Riboni, Antonio Candelieri & Matteo Borrotti (screen sharing)

11:30 – 11:45 *ProSPs: Protein Sites Prediction based on Sequence Fragments*, Massimo Cavallin, Sebastian Daberdaku, Carlo Ferrari & Michela Quadrini (screen sharing)

11:45 – 12:00 *Online semi-supervised learning from evolving data streams with meta-features and deep reinforcement learning*, Parsa Vafaie, Herna Viktor, Eric Paquet & Wojtek Michalowski (screen sharing)

(more on next page)

12:00 – 12:15 *Utilizing predictive models to identify the influence of full prior distribution in hypothesis testing problems*, Gail Gilboa Freedman & Yuval Ben David (Video)

12:15 – 12:30 *Multivariate LSTM for Stock Market Volatility Prediction*, Osama Assaf, G. Di Fatta & G. Nicosia (screen sharing)

12:30 – 14:00 Lunch

14:00 – 18:30 **Moderate Walk Alcock Tarn* + Free Time**

18:30 – 20:00 Dinner

ACAIN Session 13 & Tea
Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Varun Ojha

20:00 – 20:22 *Fast and energy-efficient neuromorphic deep learning with first-spike times*, Julian Göltz, Laura Kriener, Andreas Baumbach, Sebastian Billaudelle, Oliver Breitwieser, Benjamin Cramer, Dominik Dold, Akos Ferenc Kungl, Walter Senn, Johannes Schemmel, Karlheinz Meier & Mihai Alexandru Petrovici (Onsite)

20:22 – 20:44 *Social and Referential Gaze Behaviour: Automation towards Human-Robot Multimodal Interaction*, Vidya Somashekarappa, Christine Howes & Asad Sayeed (Onsite)

20:44 – 21:16 *Towards Understanding Neuroscience of Realisation of Information Need in light of Relevance and Satisfaction Judgement*, Sakrapee Paisalnan, Frank Pollick & Yashar Moshfeghi (Video)

21:16 – 21:28 *Learning to predict in uncertainty*, Katharina Anna Wilmes, Constanze Raltschev, Sergej Kasavica, Shankar Sachidhanandam & Walter Senn (Onsite)

21:28 – 21:38 *A recurrent visual neural network model based on the Drosophila visual pathway*, Keivan Razban Haghighi, Mikko Juusola & Jouni Takalo (Onsite)

LOD Session 14 & Tea
Conference room 2: **The Lounge** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Alberto Castellini

20:00 – 20:15 *KAFE: Knowledge And Frequency adapted Embeddings*, Awais Ashfaq, Markus Lingman & Slawomir Nowaczyk (screen sharing)

20:15 – 20:30 *Optimisation of a Workpiece Clamping Position with Reinforcement Learning for Complex Milling Applications*, Chrismarie Enslin, Vladimir Samsonov, Hans-Georg Köpken, Schirin Bär & Daniel Lütticke (screen sharing)

20:30 – 20:45 *Deep Reinforcement Learning for optimal energy management of multi-energy smart grids*, Dhekra Bousnina & Gilles Guerassimoff (screen sharing)

(more on next page)

20:45 – 21:00 *A noisy-labels approach to detecting uncompetitive auctions*, Natalya Goryunova, Egor Ianovski & Artem Baklanov (screen sharing)

21:00 – 21:15 *Numerical issues in maximum likelihood parameter estimation for Gaussian process interpolation*, Subhasish Basak, Sebastien Petit, Julien Bect & Emmanuel Vazquez (screen sharing)

21:15 – 21:30 *Explainable AI for Financial Forecasting*, Salvatore Carta, Alessandro Sebastian Podda, Diego Reforgiato Recupero & Maria Madalina Stanciu (screen sharing)

Friday, October 8

08:30 – 09:00 Arrival tea, freshly brewed coffee and homemade biscuits

Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1) Plenary Session
Chair(s): Giuseppe Nicosia

09:00 – 09:45 **LOD Keynote Speaker: Panos Pardalos, University of Florida, UK**
"Artificial Intelligence in Biomedicine"

09:45 – 10:30 **LOD Keynote Speaker: Verena Rieser, Heriot Watt University, UK**
"Advances and Challenges in Conversational AI"

10:30 – 11:00 Tea & Coffee break

LOD Session 15
Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Varun Ojha

11:00 – 11:15 *Understanding physio-chemical characteristics of carbon electrode on capacitive performance of supercapacitors: Machine Learning Approach*, Atta Muhammad, Rajat Srivastava, Matteo Fasano, Sachit Mishra, Amit, Eliodoro Chiavazzo & Pietro Asinari (Screen sharing or Onsite)

11:15 – 11:30 *Adversarial perturbations for evolutionary optimization*, Unai Garciarena, Jon Vadillo, Alexander Mendiburu & Roberto Santana (Onsite)

11:30 – 11:45 *Expressive Graph Informer Networks*, Jaak Simm, Adam Arany, Edward De Brouwer & Yves Moreau (Onsite)

11:45 – 12:00 *A Framework for Imbalanced Time-series Forecasting*, Luis Pedro Silvestrin, Leonardos Pantiskas & Mark Hoogendoorn (Onsite)

12:00 – 12:15 *Active Learning for Capturing Human Decision Policies in a Data Frugal Context*, Loïc Grossetête, Alexandre Marois, Bénédicte Chatelais, Christian Gagné & Daniel Lafond (Onsite)

12:15 – 12:30 *pH-RL: A personalization architecture to bring reinforcement learning to health practice*, Ali El Hassouni, Mark Hoogendoorn, Gusz Eiben, Vesa Muhonen, Marketa Ciharova, Annet Kleiboer, Khadicha Amarti & Heleen Riper (onsite)

LOD Session 16
Conference room 2: **The Lounge** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Emanuele La Malfa

11:00 – 11:15 *Building Knowledge Base for the Domain of Economic Mobility of Older Workers*, Ying Li, Vitalii Zakhozhyi, Yu Fu, Joy He-Yueya, Vishwa Pardeshi & Luis Salazar (screen sharing)

(more on next page)

11:15 – 11:30 *Experiments on Properties of Hidden Structures of Sparse Neural Networks*, Julian Stier, Harshil Darji & Michael Granitzer (screen sharing)

11:30 – 11:45 *Improved update rule and sampling of stochastic gradient descent with extreme early stopping for support vector machines*, Marcin Orchel & Johan Suykens (screen sharing)

11:45 – 12:00 *Malicious website detection through Deep Learning algorithms*, Norma Gutierrez, Otero Beatriz, Eva Rodriguez & Ramon Canal (screen sharing)

12:00 – 12:15 *Flexible Job-Shop Scheduling with Changeover Priorities*, Holden Milne, Opeyemi Adesina, Russell Campbell, Barbara Friesen & Masud Khawaja (Onsite)

12:15 – 12:30 *Health change detection using temporal transductive learning*, Abhay Harpale (screen sharing)

12:30 – 14:00 Lunch

LOD Session 17
Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Varun Ojha

14:00 – 14:15 *Small datasets and deep networks: A new deep learning method for time series prediction, with application to geodetic data science*, Mostafa Kiani Shahvandi & Benedikt Soja (screen sharing)

14:15 – 14:30 *Toward a new approach for tuning regularization hyperparameter in NMF*, Laura Selicato, Nicoletta Del Buono & Flavia Esposito (screen sharing)

14:30 – 14:45 *Method For Generating Explainable Deep Learning Models in the Context of Air Traffic Management*, Keith Rudd, Michelle Eshow & Mary Gibbs (screen sharing)

14:45 – 15:00 *Boosted Embeddings for Time Series Forecasting*, Sankeerth Rao Karingula, Nandini Ramanan, Rasool Tahmasbi, Mehrnaz Amjadi, Deokwoo Jung, Ricky Si, Charanraj Thimmisetty, Luisa Cabrera Polania, Marjorie Sayer, Jake Taylor & Claudionor Nunes Coelho Jr. (screen sharing)

15:00 – 15:15 *Zero-Shot Learning-Based Detection of Electric Insulators in The Wild*, Ibraheem Azeem & Moayid Ali Zaidi (screen sharing)

15:15 – 15:30 *Improved Migrating Birds Optimization Algorithm to Solve Hybrid Flowshop Scheduling Problem with Lot-streaming of Random Breakdown*, Ping Wang, Renato De Leone & Hong-Yan Sang (Video)

15:30 – 15:45 *Inference and De-Noising of Non-Gaussian Particle Distribution Functions: A Generative Modeling Approach*, John Donaghy & Kai Germaschewski (screen sharing)

15:45 – 16:00 *A Study on Relevant Features for Intraday S&P 500 Prediction Using a Hybrid Feature Selection Approach*, Mahinda Mailagaha Kumbure, Christoph Lohrmann & Pasi Luukka (screen sharing)

16:00 – 16:15 *Multi-Asset Market Making via Multi-Task Deep Reinforcement Learning*, Abbas Haider, Glenn Hawe, Hui Wang & Bryan Scotney (screen sharing)

LOD Session 18
Conference room 2: **The Lounge** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Emanuele La Malfa

14:00 – 14:15 *Machine learning methods for supervised industrial production*, Lorenzo Fiorani, Paolo Cavicchioli, Giorgia Franchini & Roberto Cavicchioli (screen sharing)

14:15 – 14:30 *Convolutional Neural Network for Classification of Aerial Survey Images in the Recognition System*, Van Trong Nguyen & Fedor Fedorovich Pashchenko (screen sharing)

14:30 – 14:45 *Anomaly Detection in Smart Grid Network using FC-based Blockchain Model and Linear SVM*, Saurabh Shukla, Subhasis Thakur & John Breslin (screen sharing)

14:45 – 15:00 *Development of a Hybrid Modeling Methodology for Oscillating Systems with Friction*, Meike Wohlleben, Amelie Bender, Sebastian Peitz & Walter Sextro (Video)

15:00 – 15:15 *Forecasting the IBEX-35 stock index using deep learning and news emotions*, Sergio Consoli, Matteo Negri, Amirhossein Tebbifakhr, Elisa Tosetti & Marco Turchi (Video)

15:15 – 15:30 *Learning Beam Search: Utilizing Machine Learning to Guide Beam Search for Solving Combinatorial Optimization Problems*, Marc Huber & Günther Raidl (Video)

15:30 – 15:45 *Modular Networks Prevent Catastrophic Interference in Model-Based Multi-Task Reinforcement Learning*, Robin Schiewer & Laurenz Wiskott (Video)

15:45 – 16:00 *Estimating Change Intensity and Duration in Human Activity Recognition using Martingales*, Jonathan Etumusei, Jorge Martinez Carracedo & Sally McClean (Video)

16:00 – 16:15 *An Integrated Approach to Produce Robust Deep Neural Network Models with High Efficiency*, Zhijian Li, Bao Wang & Jack Xin (Video)

16:15 – 16:45 Afternoon Tea

LOD Session 19
Conference room 1: **Coleridge Suite** (Zoom virtual room: LOD-ACAIN1)
Chair(s): Emanuele La Malfa

16:45 – 17:00 *The Optimized Social Distance Lab*, Des Fagan & Ruth Conroy Dalton (Screen sharing)

17:00 – 17:15 *Training Artificial Neural Networks with Gradient and Coarse-Level Correction Schemes*, Nadja Vater & Alfio Borzì (Video)

17:15 – 17:30 *A Machine Learning Approach to Daily Capacity Planning in E-Commerce Logistics*, Barıs Bayram, Büra Ülkü, Gözde Aydın, Raha Akhavan-Tabatabaei & Burcin Bozkaya (Video)

17:30 – 17:45 *On principal component analysis of the convex combination of two data matrices and its application to acoustic metamaterial filters*, Giorgio Gnecco & Andrea Bacigalupo (Video)

(more on next page)

17:45 – 18:00 *The Sea Exploration Problem Revisited*, João Dionísio, João Pedroso & Davi Santos (Video)

18:00 – 18:15 *The Label Recorder Method: Testing the Memorization Capacity of Machine Learning Models*, Kyle Rong, Aditya Khant, David Flores & George Montañez (Video)

18:15 – 18:30 *Predictable Features Elimination: An Unsupervised Approach to Feature Selection*, Pietro Barbiero, Giovanni Squillero & Alberto Tonda (Video)

18:30 – 18:45 *Employing an Adjusted Stability Measure for Multi-Criteria Model Fitting on Data Sets with Similar Features*, Andrea Bommert, Jörg Rahnenführer & Michel Lang (Video only - probably, speaker does not present on Zoom)

18:45 – 19:00 **Closing: Giuseppe Nicosia & Panos Pardalos.**

ACAIN/LOD Session 20
Conference room 2: **The Lounge** (Zoom virtual room: LOD-ACAIN2)
Chair(s): Gabriele La Malfa

16:45 – 17:00 *Reinforcement Learning in Air Traffic Contro*l, Lingyi Yang, Samuel Cohen & Jaroslav Fowkes (Onsite)

17:00 – 17:15 *Data Clustering Application in Medicine*, Mantas Lukauskas & Tomas Ruzgas (Video)

17:15 – 17:30 *Action-Conditioned Frame Prediction Without Discriminator*, David Valencia, Henry Williams, Bruce MacDonald & Ting Qiao (Video only)

17:30 – 17:45 *Deep Learning Detection of GPS Spoofing*, Olivia Jullian, Beatriz Otero, Mirjana Stojilovic, Juan José Costa, Javier Verdú & Manuel Alejandro Pajuelo (Video)

17:45 – 18:00 *Comparative analysis of clustering algorithms for synthetic and real data*, Mantas Lukauskas & Tomas Ruzgas (Video)

18:00 – 18:15 *ShufText: A Simple black box approach to evaluate the fragility of Text Classification models*, Rutuja Taware, Shraddha Varat, Gaurav Salunke, Chaitanya Gawande, Geetanjali Kale, Rahul Khengare & Raviraj Joshi (Video)

18:15 – 18:30 *A k-mer based sequence similarity for pangenomic analyses*, Vincenzo Bonnici, Andrea Cracco & Giuditta Franco (screen sharing)

18:30 – 18:45 *Thresholding procedure via Barzilai-Borwein rules for the steplength selection in Stochastic Gradient Methods*, Giorgia Franchini, Valeria Ruggiero & Ilaria Trombini (screen sharing)

19:00 – 21:00 **Gala Dinner****

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‘I wandered lonely as a cloud’

I wandered lonely as a cloud
That floats on high o’er vales and hills,
When all at once I saw a crowd,
A host of golden daffodils;
Beside the lake, beneath the trees,
Fluttering and dancing in the breeze.

Continuous as the stars that shine
and twinkle on the Milky Way,
They stretched in never-ending line
along the margin of a bay:
Ten thousand saw I at a glance,
tossing their heads in sprightly dance.

The waves beside them danced; but they
Out-did the sparkling waves in glee:
A poet could not be but gay,
in such a jocund company:
I gazed—and gazed—but little thought
what wealth the show to me had brought:

For oft, when on my couch I lie
In vacant or in pensive mood,
They flash upon that inward eye
Which is the bliss of solitude;
And then my heart with pleasure fills,
And dances with the daffodils.

William Wordsworth (1770-1850), Lake District Poet