ORGANIZED BY

27th INTERNATIONAL CONFERENCE ON ARTIFICIAL NEURAL NETWORKS

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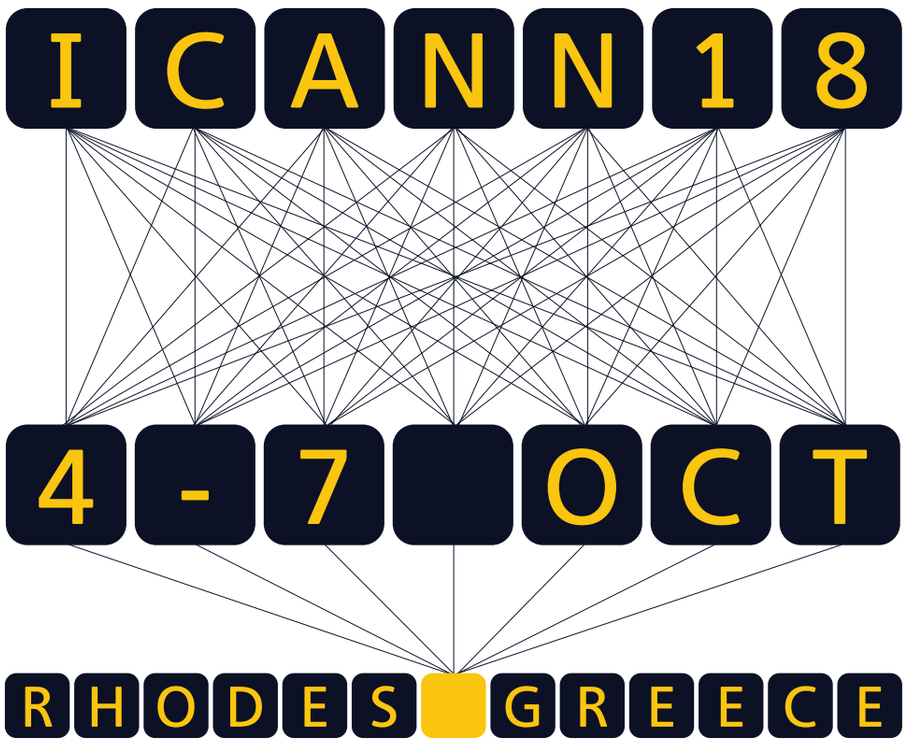
ICANN18



4-7 OCT

RHODES GREECE

CONFERENCE VENUE

Aldemar Amilia Mare

PROGRAM

EUROPEAN NEURAL NETWORK SOCIETY

Conference proceedings are published by Springer

https://e-nns.org/icann2018/

PREFACE

Technology advances of Artificial Intelligence (AI) are leading the rapidly changing world of the 21st century. We have already passed from Machine Learning to Deep Learning with numerous applications. The contribution of AI so far to the improvement of our quality of life is profound. Major challenges but also risks and threats are here. Brain inspired computing explores, simulates and imitates the structure and the function of the Human Brain, achieving high performance modeling plus visualization capabilities.

The International Conference on Artificial Neural Networks (ICANN) is the annual flagship conference of the European Neural Network Society (ENNS). It features the main tracks *Brain Inspired computing and Machine Learning research,* with strong cross-disciplinary interactions and applications. All research fields dealing with Neural Networks are present.

The 27th ICANN is held during 4-7 of October 2018 at the Aldemar Amilia Mare 5* resort and conference center at Rhodes island, Greece. The previous ICANN stops were held at Helsinki, Finland (1991), Brighton, UK (1992), Amsterdam, The Netherlands (1993), Sorrento, Italy (1994), Paris, France (1995), Bochum, Germany (1996), Lausanne, Switzerland (1997), Skovde, Sweden (1998), Edinburgh, Scotland (1999), Como, Italy (2000), Vienna, Austria (2001), Madrid, Spain (2002), Istanbul, Turkey (2003), Budapest, Hungary (2004), Warsaw, Poland (2005), Athens, Greece (2006), Porto, Portugal (2007), Prague, Czech Republic (2008), Limassol, Cyprus (2009), Thessaloniki, Greece (2010), Espoo-Helsinki, Finland (2011), Lausanne, Switzerland (2012), Sofia, Bulgaria (2013), Hamburg, Germany (2014), Barcelona, Spain (2016) and Alghero, Italy (2017).

Following a long-standing tradition, these Springer volumes belong to the Lecture Notes in Computer Science Springer Series. They contain the papers that were accepted to be presented orally or by poster during the 27th ICANN conference. The 27th ICANN Program Committee was delighted by the overwhelming response to the call for papers. All papers have passed through a peer review process by at least 2 and many times by 3 or 4 independent academic referees to resolve any conflicts. Totally 360 papers were submitted to the 27th ICANN. From them, 138 (38.3%) were accepted as full papers for oral presentation of 20 minutes with a maximum length of 10 pages, whereas 31 of them were accepted as short ones to be presented orally in 15 minutes and for inclusion in the proceedings with 8 pages. Also, 41 papers (11.4%) were accepted as full papers for poster presentation (up to 10 pages long), whereas 11 were accepted as short papers for poster presentation (maximum length of 8 pages).

The accepted papers of the 27th ICANN conference are related to the following thematic topics:

AI and Bioinformatics
Bayesian and Echo State Networks
Brain Inspired Computing
Chaotic Complex Models
Clustering, Mining, Exploratory Analysis
Coding Architectures
Complex Firing Patterns
Convolutional Neural Networks
Deep Learning (DL)
– DL in Real Time Systems
– DL and Big Data Analytics
– DL and Big Data
– DL and Forensics
– DL and Cybersecurity
– DL and Social Networks
Evolving Systems – Optimization
Extreme Learning Machines
From Neurons to Neuromorphism
From Sensation to Perception
From Single Neurons to Networks
Fuzzy Modeling
Hierarchical ANN
Inference and Recognition
Information and Optimization
Interacting with The Brain
Machine Learning (ML)
– ML for Bio Medical systems
– ML and Video-Image Processing
– ML and Forensics
– ML and Cybersecurity
– ML and Social Media
– ML in Engineering
Movement and Motion Detection
Multilayer Perceptrons and Kernel Networks
Natural Language
Object and Face Recognition
Recurrent Neural Networks and Reservoir Computing
Reinforcement Learning
Reservoir Computing
Self-Organizing Maps
Spiking Dynamics/Spiking ANN
Support Vector Machines
Swarm Intelligence and Decision-Making
Text Mining
Theoretical Neural Computation
Time Series and Forecasting
Training and Learning

The authors of submitted papers come from 34 different countries from all over the globe, namely: Belgium, Brazil, Bulgaria, Canada, China, Czech Republic, Cyprus, Egypt, Finland, France, Germany, Greece, India, Iran, Ireland, Israel, Italy, Japan, Luxembourg, The Netherlands, Norway, Oman, Pakistan, Poland, Portugal, Romania, Russia, Slovakia, Spain, Switzerland, Tunisia, Turkey, UK, USA.

PREFACE

Four keynote speakers were invited, and they will give lectures in timely aspects of AI.

Robert Kozma (University of Massachusetts Amherst).
"Cognitive Phase Transitions in the Cerebral Cortex" -
John Taylor Memorial Lecture

Nathan Netanyahu (Bar-Ilan University, Israel).
"On the Deep Learning R/Evolution in Computer Vision"

Marios Polycarpou (University of Cyprus).
"From Machine Learning to Machine Diagnostics"

Sotirios Tsaftaris (University of Edinburgh, UK).
Title: "Multimodal deep learning in biomedical image analysis".

We hope that the proceedings will help researchers worldwide to understand and to be aware of timely evolutions in Artificial Intelligence and more specifically in Artificial Neural Networks. We do believe that they will be of major interest for scientists over the globe and that they will stimulate further research.

October 2018

27th ICANN 2018 Chairs

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Robert Kozma

Dr. Kozma holds a Ph.D. in Physics (Delft, The Netherlands, 1992), two M.Sc. degrees (Mathematics, Budapest, Hungary, 1988; Power Engineering, Moscow, Russia, 1982). He is Professor of Mathematical Sciences and Director of the Center of Large-Scale Integration and Optimization Networks (CLION), the University of Memphis, TN, USA. He is Visiting Professor at College of Information and Computer Sciences, University of Massachusetts Amherst, where he is Director of the Biologically-Inspired Neural and Dynamical Systems (BINDS) Lab, and leads the DARPA Program on Superior Artificial Intelligence.

Previous affiliations include joint appointment with the Division of Neurobiology and the EECS at UC Berkeley (1998-2000), and visiting positions at NASA/JPL, Sarnoff Co., Princeton, NJ; Lawrence Berkeley Laboratory (LBL); and AFRL WPAFB, Dayton, OH. He has been Associate Professor at Tohoku University, Sendai, Japan, Lecturer at Otago University, Dunedin, New Zealand, and Research Fellow at the Hungarian Academy of Sciences, Budapest, Hungary. His research is focused on computational neurodynamics, large-scale brain networks, and applying biologically motivated and cognitive principles for the development of intelligent systems. Dr. Kozma has published 8 books, 350+ papers, and 2 patents. His most recent book has been co-authored by Walter J. Freeman III on "Cognitive Phase Transitions in the Cerebral Cortex – Enhancing the Neuron Doctrine by Modeling Neural Fields," Springer, Germany (2016). Dr. Kozma's research has been supported by NSF, NASA, JPL, AFRL, AFOSR, DARPA, FedEx, and by other agencies.

Dr. Kozma is Fellow of IEEE and Fellow of the International Neural Network Society (INNS). He is President (2017-2018) of INNS, and serves on the Governing Board of IEEE Systems, Man, and Cybernetics Society (2016-2018). He has served on the AdCom of the IEEE Computational Intelligence Society (2009-2012) and the Board of Governors of the International Neural Network Society (2007-2012). He has been General Chair of IJCNN2009, Atlanta, USA. He is Associate Editor of Neural Networks, Neurocomputing, IEEE Transactions of Cybernetics, Cognitive Systems Research, and Cognitive Neurodynamics. Dr. Kozma is the recipient of "Gabor Award" of the International Neural Network Society (2011); the "Alumni Association Distinguished Research Achievement Award" (2010); he has been a "National Research Council (NRC) Senior Fellow" (2006-2008).

Cognitive Phase Transitions in the Cerebral Cortex (John Taylor Memorial Lecture)

Everyday subjective experience of the stream of consciousness suggests continuous cognitive processing in time and smooth underlying brain dynamics. Brain monitoring techniques with markedly improved spatio-temporal resolution, however, show that relatively smooth periods in brain dynamics are frequently interrupted by sudden changes and intermittent discontinuities, evidencing singularities. There are frequent transitions between periods of large-scale synchronization and intermittent desynchronization at alpha-theta rates. These observations support the hypothesis about the cinematic model of cognitive processing, according to which higher cognition can be viewed as multiple movies superimposed in time and space. The metastable spatial patterns of field potentials manifest the frames, and the rapid transitions provide the shutter from each pattern to the next. Recent experimental evidence indicates that the observed discontinuities are not merely important aspects of cognition; they are key attributes of intelligent behavior representing the cognitive "Aha" moment of sudden insight and deep understanding in humans and animals. The discontinuities can be characterized as phase transitions in graphs and networks. We introduce computational models to implement these insights in a new generation of devices with robust artificial intelligence, including oscillatory neuromorphic memories, and self-developing autonomous robots.

Nathan Netanyahu

Nathan S. Netanyahu is a Full Professor in the Department of Computer Science at Bar-Ilan University, Israel, and is also affiliated with the Gonda Brain Research Center at Bar-Ilan University and the Center for Automation Research/ UMIACS at the University of Maryland, College Park. He has previously worked for the Israeli Ministry of Defense, the Space Data and Computing Division at NASA's Goddard Space Flight Center (GSFC), and for the Center for Excellence in Space Data and Information Sciences (CESDIS) at NASA/ GSFC. Professor Netanyahu's current research interests are in the areas of computational intelligence, computational statistics, image processing, pattern recognition, and remote sensing. He has coauthored roughly 100 refereed papers that appeared in journals, international conference proceedings, and book chapters, has served as Associate Editor for Pattern Recognition, and is co-editor of the books, Computer and Games, 4th International Conference (by Springer Verlag, 2006) and Image Registration for Remote Sensing (by Cambridge University Press, 2011).

On The Deep Learning R/Evolution in Computer Vision

Computer Vision (CV) is an interdisciplinary field of Artificial Intelligence (AI), which is concerned with the embedding of human visual capabilities in a computerized system. The main thrust, essentially, of CV is to generate an "intelligent" high-level description of the world for a given scene (i.e., a digital image or a video sequence), such that when interfaced with other thought processes can elicit, ultimately, appropriate action. In this talk we will review several central CV tasks (e.g., object localization, object detection, and object classification/recognition) and traditional approaches taken for handling these tasks for over 50 years. Noting the limited performance of standard methods applied, we briefly survey the evolution of artificial neural networks (ANN) during this extended period, and focus, specifically, on the ongoing revolutionary performance of deep learning (DL) techniques for the above CV tasks during the past few years. In particular, we provide also an overview of our DL activities, in the context of CV, at Bar-Ilan University. Finally, we discuss future research and development challenges in CV in light of further employment of prospective DL innovations.

Marios Polycarpou

Marios Polycarpou is a Professor of Electrical and Computer Engineering and the Director of the KIOS Research and Innovation Center of Excellence at the University of Cyprus. He received the B.A degree in Computer Science and the B.Sc. in Electrical Engineering, both from Rice University, USA in 1987, and the M.S. and Ph.D. degrees in Electrical Engineering from the University of Southern California, in 1989 and 1992 respectively. His teaching and research interests are in intelligent systems and networks, adaptive and cooperative control systems, computational intelligence, fault diagnosis and distributed agents. Dr. Polycarpou has published more than 300 articles in refereed journals, edited books and refereed conference proceedings, and co-authored 7 books. He is also the holder of 6 patents.

Prof. Polycarpou is a Fellow of IEEE and IFAC. He is the recipient of the 2016 IEEE Neural Networks Pioneer Award. He received with his co-authors the 2014 Best Paper Award for the journal Building and Environment (Elsevier). Prof. Polycarpou served as the President of the IEEE Computational Intelligence Society (2012-2013), and as the Editor-in-Chief of the IEEE Transactions on Neural Networks and Learning Systems (2004-2010). He is currently the President of the European Control Association (EUCA). Prof. Polycarpou has participated in more than 60 research projects/grants, funded by several agencies and industry in Europe and the United States, including the prestigious European Research Council (ERC) Advanced Grant.

From Machine Learning to Machine Diagnostics

During the last few years, there have has been remarkable progress in utilizing machine learning methods in several applications that benefit from deriving useful patterns among large volumes of data. These advances have attracted significant attention from industry due to the prospective of reducing the cost of predicting future events and making intelligent decisions based on data from past experiences. In this context, a key area that can benefit greatly from the use of machine learning is the task of detecting and diagnosing abnormal behavior in dynamical systems, especially in safety-critical, large-scale applications. The goal of this presentation is to provide insight into the problem of detecting, isolating and self-correcting abnormal or faulty behavior in large-scale dynamical systems, to present some design methodologies based on machine learning and to show some illustrative examples. The ultimate goal is to develop the foundation of the concept of machine diagnostics, which would empower smart software algorithms to continuously monitor the health of dynamical systems during the lifetime of their operation.

Sotirios Tsaftaris

Prof. Sotirios A. Tsaftaris, obtained his PhD and MSc degrees in Electrical Engineering and Computer Science (EECS) from Northwestern University, USA in 2006 and 2003 respectively. He obtained his Diploma in Electrical and Computer Engineering from the Aristotle University of Thessaloniki, Greece. Currently, he is a Chancellor's Fellow (Senior Lecturer, US equivalent Associate Professor) in the School of Engineering at the University of Edinburgh (UK). He is also a Turing Fellow with the Alan Turing Institute.

From 2006 to 2011, he was a research assistant professor with the Departments of EECS and Radiology, Northwestern University (USA). From 2011-2015, he was with IMT Institute for Advanced Studies, Lucca (Italy) serving as Director of the Pattern Recognition and Image Analysis Unit.

He is an Associate Editor for the IEEE Journal of Biomedical and Health Informatics and for Digital Signal Processing – Journal (Elsevier). He was Doctoral Symposium Chair for IEEE ICIP 2018 (Athens). He has served as area chair for IEEE ICME 2018 (San Diego), ICCV 2017 (Venice), MMSP 2016 (Montreal), and VCIP 2015 (Singapore). He has also co-organized workshops for ICCV (2017), ECCV (2014), BMVC (2015), and MICCAI (2016, 2017). He has also served as guest editor (IEEE Transactions on Medical Imaging; Digital Signal Processing – Software X; Machine Vision and Applications).

He has the received best paper award (STACOM 2017), twice the Magna Cum Laude Award (International Society for Magnetic Resonance in Medicine, ISMRM, in 2012 and 2014), and was a finalist for the Early Career Award (Society for Cardiovascular Magnetic Resonance, SCMR, in 2011).

He has authored more than 100 journal and conference papers particularly in interdisciplinary fields and his work is (or has been) supported by the National Institutes of Health (USA), EPSRC & BBSRC (UK), the European Union, the Italian Government, and several non-profits and industrial partners.

His research interests are in machine learning, image analysis (medical image computing), image processing, and distributed computing.

Prof. Tsaftaris is a Murphy, Onassis, and Marie Curie Fellow. He is also member of IEEE, SMRM, SCMR, and IAPR.

Multimodal deep learning in biomedical image analysis

Nowadays images are typically accompanied by additional information (e.g. the clinical history of the patient). At the same time, for example, magnetic resonance imaging exams typically contain more than one image modality: they show the same anatomy under different acquisition strategies revealing various pathophysiological information. The detection of disease, segmentation of anatomy and other classical analysis tasks, can benefit from a multimodal view to analysis that leverages shared information across the sources yet preserves unique (critical for diagnosis) information. It is without surprise that radiologists analyse data in this fashion, reviewing the exam as a whole. Yet, when aiming to automate analysis tasks, we still treat different image modalities in isolation and tend to ignore additional (non-image) information. In this talk, I will present recent work in learning with deep neural networks, latent embeddings suitable for multimodal processing, and highlight opportunities and challenges in this area.

BRIEFPROG

THU4

12:00-18:00	REGISTRATION				
13:30-14:30	LUNCH				
14:30-16:00	SESSION 01 **MAL1 LEA1**	SESSION 02 **DEE1**	SESSION 03 **REO FUL1**	SESSION 04 **DEE2 REC1**	
16:00-17:30	SESSION 05 **MOE1 EFAR**	SESSION 06 **SNAI**	SESSION 07 **REC2 SIM²**	SESSION 08 **CNN1 NL1**	
17:30-18:00	COFFEE BREAK				
18:00-19:15	SESSION 09 **SO SVM**	SESSION 10 **LEA2**			
21:00	WELCOME RECEPTION				

FRI5

08:30-17:30	REGISTRATION			
09:00-09:30	**OPENING SESSION**			
09:30-10:30	KEYNOTE 1 **ROBERT KOZMA**			
10:30-11:30	SESSION 11 **BRIC1**	SESSION 12 **MV-IPR**	SESSION 13 **DDE3 NN_COM**	SESSION 14 **SP1 REI1**
11:30-12:00	COFFEE BREAK			
12:00-13:30	SESSION 15 **AUT WA ECS**	SESSION 16 **DEE4 FES**	SESSION 17 **ROB1 REI2**	SESSION 18 **OPT CLA1**
13:30-14:30	LUNCH			
14:30-15:30	KEYNOTE 2 **MARIOS POLYCARPOU**			
15:30-17:00	SESSION 19 **EX&DEE EMORE**	SESSION 20 **DEE5 CHAO**	SESSION 21 **REC3**	SESSION 22 **MED1 NL2**
17:00-17:30	COFFEE BREAK			
17:00-18:30	**POSTER SESSION A**			

SAT6

09:00-14:00	REGISTRATION			
09:30-10:30	KEYNOTE 3 **SOTIRIOS TSAFTARIS**			
10:30-12:00	SESSION 23 **CNN2**	SESSION 24 **RBO2**	SESSION 25 **REC4**	SESSION 26 **FUL2 LEA3**
12:00-12:30	COFFEE BREAK			
12:30-13:45	SESSION 27 **SP2**	SESSION 28 **BRIC2**	SESSION 29 **LEA4**	SESSION 30 **CLA2**
13:45-14:45	LUNCH			
15:30	RHODES GUIDED TOUR			
21:00	CONFERENCE PARTY			

SUN7

09:00-17:00	REGISTRATION			
09:30-10:30	KEYNOTE 4 **NATHAN NETANYAHU**			
10:30-12:00	SESSION 31 **DEE6**	SESSION 32 **CNN3 WAV**	SESSION 33 **SP3 HIE**	SESSION 34 **MAL2 BIOIN**
12:00-12:30	COFFEE BREAK			
12:30-14:00	SESSION 35 **DEE7 RBF**	SPECIAL SESSION **INM²DL**	SESSION 36 **DEE8**	SESSION 37 **MAL3 DEE9**
14:00-15:00	LUNCH			
15:00-16:30		SESSION 38 **DEE10 MED2**	SESSION 39 **DEE11**	SESSION 40 **FUZ3 DEE12**
16:30-17:00	COFFEE BREAK			
16:30-18:00	**POSTER SESSION B**			
18:00-18:15	**CLOSING SESSION**			

THU4

12:00 → 18:00 **Registration**

13:30 → 14:30 **Lunch**

14:30 ↓ 16:00

SESSION 1 — ROOM A — Machine Learning 1 - Learning 1 (MAL1 - LEA1)

Chair **Lluís Belanche**

Chunjie Luo
Cosine Normalization: Using Cosine Similarity Instead of Dot Product in Neural Networks (full)

Shuqing Wang, Yongmei Lei
Fast Communication Structure for Asynchronous Distributed ADMM under Unbalance Process Arrival Pattern (full)

Ege Beyazit, Matin Hosseini, Anthony Maida, Xindong Wu
Learning Simplified Decision Boundaries from Trapezoidal Data Streams (full)

Christian Limberg, Heiko Wersing, Helge Ritter
Improving Active Learning by Avoiding Ambiguous Samples (full)

SESSION 2 — ROOM B — Deep Learning 1 (DEE1)

Chair **Doina Logofatu**

Arjun Sharma, Anirban Mitra, Sumit Sharma, Sudip Roy
Estimation of Air Quality Index from Seasonal Trends using Deep Neural Network (full)

Burak Satar, Ahmet Emir Dirik
Deep Learning Based Vehicle Make-Model Classification (full)

Hongyu Li, Tianqi Han
DeepVol: Deep Fruit Volume Estimation (full)

Benedikt Pfülb, Alexander Gepperth, André Kilian, Saad Abdullah
Catastrophic Forgetting: Still a Problem for DNNs (short)

16:00 ↓ 17:30

SESSION 5 — ROOM A — Motion Estimation - Emotion & Face Recognition (MOE - EFAR)

Chair **Christina Kluever**

Hongxin Wang, Jigen Peng, Shigang Yue
A Feedback Neural Network for Small Target Motion Detection in Cluttered Backgrounds (full)

Yannan Xing, Paul Kirkland, Gaetano Di Caterina, John Soraghan, George Matich
Real-Time Embedded Intelligence System: Emotion Recognition on Raspberry Pi with Intel NCS (short)

SESSION 6 — ROOM B — Social Networks & AI (SNAI)

Chair **Antonis Papaleonidas**

Yanan Cao, Zhezhou Kang, Yanmin Shang, Yanbing Liu
Hierarchical Attention Networks for User Profile Inference in Social Media Systems (full)

Sarah Zouinina, Nistor Grozavu, Younes Bennani, Abdelouahid Lyhyaoui, Nicoleta Rogovschi

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**Full conference/workshop papers are assigned 20 minutes; short conference/workshop papers are assigned 15 minutes*

14:30 ↓ 16:00

SESSION 3 — ROOM C — Recommendation Systems - Fuzzy Logic 1 (REO - FUL1)

Chair **Lazaros Iliadis**

Xiaofang Zhang, Qian Zhou, Tieke He, Bin Liang
Con-CNAME: A Contextual Multi-Armed Bandit Algorithm for Personalized Recommendations (full)

David Lenz, Michael Guckert, Christian Schulze
Real-time Session-based Recommendations using LSTM with Neural Embeddings (full)

Sara Rizo Rodríguez, Francisco Carvalho
Fuzzy Clustering Algorithm Based on Adaptive Euclidean Distance and Entropy Regularization for Interval-valued Data (full)

Anirban Mitra, Arjun Sharma, Sumit Sharma, Sudip Roy
Thermal Comfort Index Estimation and Parameter Selection Using Fuzzy Convolutional Neural Network (full)

SESSION 4 — ROOM D — Deep Learning 2 - Recurrent ANN 1 (DEE2 - REC1)

Chair **Alexander Gepperth**

Hongyu Li, Junhua Qiu, Fan Zhu
TextNet for Text-related Image Quality Assessment (full)

Xiaoping Zheng, Song He, Xinyu Song, Zhongnan Zhang, Xiaochen Bo
DTI-RCNN: New Efficient Hybrid Neural Network Model to Predict Drug-target Interactions (full)

Zengwei Zheng, Yanzhen Zhou, Lin Sun, Jianping Cai
A RNN-based Multi-factors Model for Repeat Consumption Prediction (full)

Abhijit Mahalunkar, John Kelleher
Using Regular Languages to Explore the Representational Capacity of Recurrent Neural Architectures (full)

16:00 ↓ 17:30

SESSION 7 — ROOM C — Recurrent ANN 2 – Similarity Modeling (REC2 - SIM2)

Chair **Gonzalo Martínez-Muñoz**

Felipe Carregosa, Aline Paes, Gerson Zaverucha
Lightweight Neural Programming: The GRPU (full)

Jiyi Li, Yukino Baba, Hisashi Kashima
Incorporating Worker Similarity for Label Aggregation in Crowdsourcing (full)

SESSION 8 — ROOM D — Convolutional Neural Networks 1 - Natural Language 1 (CNN1 - NL1)

Chair **Sudip Roy**

Annika Lindh, Robert Ross, Abhijit Mahalunkar, Giancarlo Salton, John Kelleher
Generating Diverse and Meaningful Captions - Unsupervised Specificity Optimization for Image Captioning (full)

Alper Ahmetoğlu, Ozan İrsoy, Ethem Alpaydın
Convolutional Soft Decision Trees (short)

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16:00 ↓ 17:30

SESSION 5 — Motion Estimation - Emotion & Face Recognition (MOE - EFAR)

ROOM **A**

Ji Liu, Shuai Li, Hong Qin, Aimin Hao
Automatic Beautification for Group-photo Facial Expressions Using Novel Bayesian GANs (full)

Huatian Wang, Shigang Yue, Jigen Peng, Paul Baxter, Chun Zhang, Zhihua Wang
A Model for Detection of Angular Velocity of Image Motion Based on the Temporal Tuning of the Drosophila (full)

SESSION 6 — Social Networks & AI (SNAI)

ROOM **B**

Sabina-Adriana Floria, Florin Leon, Doina Logofatu
A Credibility-Based Analysis of Information Diffusion in Social Networks (full)

Kan Li, Lingling Li, Chao Xiang
A Hierarchy based Influence Maximization Algorithm in Social Networks (full)

17:30 → 18:00 Coffee Break

18:00 ↓ 19:15

SESSION 9 — Self Organizing / SVM (SO-SVM)

ROOM **A**

Chair **Gerson Zaverucha**

Waldemar Hartwig, Christina Klüver, Adnan Aziz, Dirk Hoffstadt
Classification of SIP Attack Variants with a Hybrid Self-enforcing Network (full)

Alexander Gepperth, Ayanava Sarkar, Thomas Kopinski
An Energy-based Convolutional SOM Model with Self-adaptation Capabilities (short)

Maryam Sabzevari, Gonzalo Martínez Muñoz, Alberto Suárez
Randomization vs Optimization in SVM Ensembles (short)

Antreas Dionysiou, Chris Christodoulou, Vasilis Promponas, Michalis Agathocleous
Convolutional Neural Networks in Combination with Support Vector Machines for Complex Sequential Data Classification (short)

SESSION 10 — Learning 2 (LEA2)

ROOM **B**

Chair **Yongmei Lei**

Xue Han, Hongping Yan, Junge Zhang, Lingfeng Wang
ACM: Learning Dynamic Multi-Agent Cooperation via Attentional Communication Model (full)

Lluís Belanche
Fast Supervised Selection of Prototypes for Metric-based Learning (full)

Igor Isaev, Sergey Burikov, Tatiana Dolenko, Kirill Laptinskiy, Alexey Vervald, Sergey Dolenko
Joint Application of Group Determination of Parameters and of Training with Noise Addition to Improve the Resilience of the Neural Network Solution of the Inverse Problem in Spectroscopy to Noise in Data (full)

21:00 → Welcome Reception

16:00 ↓ 17:30

SESSION 7 — Recurrent ANN 2 – Similarity Modeling (REC2 - SIM2)

ROOM **C**

Rajkumar Ramamurthy, Christian Bauckhage, Rafet Sifa, Stefan Wrobel
Policy Learning using SPSA (full)

Gul Muhammad Khan, Nayab Khan
Learning Trends on the Fly in Time Series Data Using Plastic CGP Evolved Recurrent Neural Networks (short)

SESSION 8 — Convolutional Neural Networks 1 - Natural Language 1 (CNN1 - NL1)

ROOM **D**

Na Jiang, Sichen Bai, Yue Xu, Zhong Zhou, Wei Wu
Online Multi-object Tracking Exploiting Pose Estimation and Global-local Appearance Features (short)

Konstantinos Demertzis, Lazaros Iliadis, Vardis-Dimitris Anezakis
A Dynamic Ensemble Learning Framework for Data Stream Analysis and Real-time Threat Detection (full)

**Full conference/workshop papers are assigned 20 minutes; short conference/workshop papers are assigned 15 minutes*

FRI5

08:30 → 17:30 **Registration**

09:00 → 09:30 **Opening Session**

09:30 ↓ 10:30

KEYNOTE 1 ROOM **A**

"John Taylor Memorial Lecture"

Cognitive Phase Transitions in the Cerebral Cortex

Robert Kozma

Chair **Vera Kurkova**

10:30 ↓ 11:30

SESSION 11 ROOM **A**

Brain Inspired Computing 1 (BRIC1)

Chair **Robert Kozma**

Jimmy Gaudreault, Hideaki Shimazaki
State-space Analysis of an Ising Model Reveals Contributions of Pairwise Interactions to Sparseness, Fluctuation, and Stimulus Coding of Monkey V1 Neurons (full)

Gerrit Ecke, Fabian Mikulasch, Sebastian Bruijns, Thede Witschel, Aristides Arrenberg, Hanspeter Mallot
Sparse Coding Predicts Optic Flow Specificities of Zebrafish Pretectal Neurons (full)

Sylvain Chevallier, Guillaume Bao, Mayssa Hammami, Fabienne Marlats, Louis Mayaud, Djillali Annane, Frédéric Lofaso, Eric Azabou
Brain-machine Interface for Mechanical Ventilation Using Respiratory-related Evoked Potential (full)

SESSION 12 ROOM **B**

Machine Vision / Image Processing (MV-IPR)

Chair **Olga Senyukova**

Xiaomao Zhou, Cornelius Weber, Chandrakant Bothe, Stefan Wermter
A Hybrid Planning Strategy through Learning from Vision for Target-directed Navigation (full)

Liping Han
Local Decimal Pattern for Pollen Image Recognition (full)

Guillermo Sarasa, Aaron Montero, Ana Granados, Francisco B Rodriguez
Compression-based Clustering of Video Human Activity Using an ASCII Encoding (full)

11:30 → 12:00 **Coffee Break**

10:30 ↓ 11:30

SESSION 13 ROOM **C**

Deep Learning 3 - ANN Complexity / Sparsity (DEE3- NN_COM)

Chair **Paulo Cortez**

Vera Kurkova
Sparsity and Complexity of Networks Computing Highly-varying Functions (full)

Zakhriya Alhassan, Stephen McGough, Riyad Alshimmary, Tahani Daghstani, David Budgen, Noura Al Moubayed
Type-2 Diabetes Mellitus Diagnosis from Time Series Clinical Data using Deep Learning Models (full)

Paolo Andreini, Simone Bonechi, Monica Bianchini, Alessandro Mecocci, Franco Scarselli
A Deep Learning Approach to Bacterial Colony Segmentation (full)

SESSION 14 ROOM **D**

Spiking 1 - Reinforcement 1 (SP1 - REI1)

Chair **Sander Bohte**

Camilo Vasquez Tieck, Marin Vlastelica, Jacques Kaiser, Arne Roennau, Marc-Oliver Gewaltig, Rüdiger Dillmann
Learning Continuous Muscle Control for a Multi-joint Arm by Extending Proximal Policy Optimization with a Liquid State Machine (full)

Guoyong Shi, Xianghong Lin
A Supervised Multi-Spike Learning Algorithm for Recurrent Spiking Neural Networks (full)

Jacques Kaiser, Jakob Weinland, Philip Keller, Lea Steffen, Camilo Vasquez Tieck, Daniel Reichard, Arne Roennau, Jörg Conradt, Rüdiger Dillmann
Microsaccades for Neuromorphic Stereo Vision (full)

10:30 ↓ 11:30

**Full conference/workshop papers are assigned 20 minutes; short conference/workshop papers are assigned 15 minutes*

12:00 ↓ 13:30

SESSION 15 — Autoencoders-Wavelet-Echo State NN (AUT–WA-ECS)
ROOM A

Chair **John Kelleher**

Naziha Dhibi
A Study of the Influence of Wavelet Number Change in the Wavelet Neural Network Architecture for 3D Mesh Deformation Using Trust Region Spherical Parameterization (full)

Eleonora Di Gregorio, Claudio Gallicchio, Alessio Micheli
Combining Memory and Non-linearity in Echo State Networks (full)

Mihai Teletin, Gabriela Czibula, Maria-Iuliana Bocicor, Silvana Albert, Alessandro Pandini
Deep Autoencoders for Additional Insight into Protein Dynamics (full)

Hoang Minh Nguyen, Gaurav Kalra, Tae Joon Jun, Daeyoung Kim
A Novel Echo State Network Model Using Bayesian Ridge Regression and Independent Component Analysis (full)

SESSION 16 — Deep Learning 4 - Feature Selection (DEE4 - FES)
ROOM B

Chair **Jacek Kabziński**

Sérgio Gonçalves, Paulo Cortez, Sérgio Moro
A Deep Learning Approach for Sentence Classification of Scientific Abstracts (full)

Kazuhiko Takahashi, Gauvain Huve, Masafumi Hashimoto
fNIRS-based Brain-computer Interface Using Deep Neural Networks for Classifying the Mental State of Drivers (full)

Emmanuel Okafor, Gerard Berendsen, Lambert Schomaker, Marco Wiering
Detection and Recognition of Badgers using Deep Learning (full)

Atalya Waissman, Aharon Bar-Hillel
Input-dependently Feature-map Pruning (short)

13:30 → 14:30 — Lunch

14:30 ↓ 15:30

KEYNOTE 2
ROOM A

From Machine Learning to Machine Diagnostics

Marios Polycarpou

Chair **Sotirios Tsaftaris**

15:30 ↓ 17:00

SESSION 19 — Extreme & Deep Learning – Emotion Recognition (EX&DEE - EMORE)
ROOM A

Chair **George Tsekouras**

Jacek Kabziński
Rank-revealing Orthogonal Decomposition in Extreme Learning Machine Design (full)

SESSION 20 — Deep Learning 5 - Chaotic Complex Models (DEE5 - CHAO)
ROOM B

Chair **Lazaros Iliadis**

Saisai Li, Shuqin Li, Meng Ding
Research on Fight the Landlords' Single Card Guessing Based on Deep Learning (full)

SESSION 19 ↓ 16:45

12:00 ↓ 13:30

SESSION 17 — Robotics 1 - Reinforcement ANN 2 (ROB1 - REI2)
ROOM C

Chair **Sebastian Otte**

Sophie Klecker, Bassem Hichri, Peter Plapper
Learning-While Controlling RBF-NN for Robot Dynamics Approximation in Neuro-inspired Control of Switched Nonlinear Systems (full)

Daniel Speck, Pablo Barros, Stefan Wermter
De-Noise-GAN: De-noising Images to Improve RoboCup Soccer Ball Detection (full)

Sander Bohte, Marios Karamanis, Davide Zambrano
Continuous-time Spike-based Reinforcement Learning for Working Memory Tasks (full)

Wenpeng Liu, Yanan Cao, Yanbing Liu, Yue Hu, Jianlong Tan
Reinforcement Learning for Joint Extraction of Entities and Relation (full)

SESSION 18 — Optimization - Classification1 (OPT-CLA1)
ROOM D

Chair **Jurgen Kluever**

Taisuke Kobayashi
Check Regularization: Combining Modularity and Elasticity for Memory Consolidation (full)

Quanhua Xu
Imbalanced Data Classification Based On MBCDK-means Undersampling and GA-ANN (full)

Ángel Lareo, Pablo Varona, Francisco de Borja Rodríguez
Evolutionary Tuning of a Pulse Mormyrid Electromotor Model to Generate Stereotyped Sequences of Electrical Pulse Intervals (full)

Chenxin Sun, Na Jiang, Lei Zhang, Yuehua Wang, Wei Wu, Zhong Zhou
Unified Framework for Joint Attribute Classification and Person Re-identification (full)

15:30 ↓ 17:00

SESSION 21 — Recurrent ANN 3 (REC3)
ROOM C

Chair **Athanasios Koutras**

Rafet Sifa, Daniel Paurat, Daniel Trabold, Christian Bauckhage
Simple Recurrent Neural Networks for Support Vector Machine Training (full)

SESSION 22 — Medical AI Systems 1 - Natural Language2 (MED1-NL2)
ROOM D

Chair **Ilias Maglogiannis**

Nicolo Savioli, Enrico Grisan, Erich Cosmi, Silvia Visentin, Pablo Lamata, Giovanni Montana
Temporal Convolution Networks for Real-Time Abdominal Fetal Aorta Analysis with Ultrasound (full)

15:30 ↓ 17:00

SESSION 19 ROOM A

Extreme & Deep Learning – Emotion Recognition (EX&DEE - EMORE)

SESSION 19 ↓ 16:45

Lionel Prevost, Maxime Sazadaly, Arthor Fagot, Pierre Pinchon, Myriam Maumy-Bertrand
Fast and Accurate Affect Prediction using a Hierarchy of Random Forests (full)

Jivitesh Sharma, Ole-Christoffer Granmo, Morten Goodwin
Deep CNN-ELM Hybrid Models for Fire Detection in Images (full)

Linjuan Zhang, Longbiao Wang, Jianwu Dang, Lili Guo, Qiang Yu
Gender-aware CNN-BLSTM for Speech Emotion Recognition (short)

SESSION 20 ROOM B

Deep Learning 5 - Chaotic Complex Models (DEE5 - CHAO)

Ryoma Sato, Hisashi Kashima, Takehiro Yamamoto
Short-term Precipitation Prediction with Skip-connected PredNet (full)

Takaya Ueda, Masataka Seo, Ikuko Nishikawa
Data Correction by a Generative Model with an Encoder and its Application to Structure Design (full)

Daisuke Karakama, Norihito Katamura, Chihiro Nakano, Yuko Osana
Chaotic Complex-Valued Associative Memory with Adaptive Scaling Factor (full)

17:00 → 17:30 Coffee Break

17:00 → 18:30 ROOM A

Poster Session A

Guangli Li, Lei Liu, Xueying Wang, Xiao Dong, Peng Zhao, Xiaobing Feng
Auto-tuning Neural Network Quantization Framework for Collaborative Inference Between the Cloud and Edge (full)

Jingfei Han, Wenge Rong, Fang Zhang, Yutao Zhang, Jie Tang, Zhang Xiong
Interactive Area Topics Extraction with Policy Gradient (full)

Yang Li, Wenyu Zhou, Guiwen Lv, Guibo Luo, Yuesheng Zhu, Ji Liu
Classification of Bone Tumor on CT Images Using Deep Convolutional Neural Network (full)

Leyuan Qu, Cornelius Weber, Egor Lakomkin, Johannes Twiefel, Stefan Wermter
Combining Articulatory Features with End-to-end Learning in Speech Recognition (full)

Alexey Potapov, Sergey Rodionov, Hugo Latapie, Enzo Fenoglio
Metric Embedding Autoencoders for Unsupervised Cross-Dataset Transfer Learning (full)

Cosme Llerena Aguilar, Detlef Mueller, Roderick Adams, Neil Davey, Yi Sun
Estimation of Microphysical Parameters of Atmospheric Pollution using Machine Learning (full)

Zhihao Ye, Ruichu Cai, Zhaohui Liao, Zhifeng Hao, Jinfen Li
Generating Natural Answers on Knowledge Bases and Text by Sequence-to-Sequence Learning (full)

Xiao Dong, Lei Liu, Guangli Li, Peng Zhao, Xiaobing Feng
Fast CNN Pruning via Redundancy-Aware Training (full)

Jiri Blahuta, Tomas Soukup, Jakub Skacel
Pilot Design of Rule-based System and Artificial Neural Network to Risk Evaluation of Atherosclerotic Plaques in Long-range Clinical Research (full)

Giannis Nikolentzos, Polykarpos Meladianos, Antoine Jean-Pierre Tixier, Konstantinos Skianis, Michalis Vazirgiannis
Kernel Graph Convolutional Neural Networks (full)

Oscar Chang, Hod Lipson
Balanced and Deterministic Weight-sharing Helps Network Performance (full)

Andreas Bougiouklis, Antonis Korkofigkas, Giorgos Stamou
Improving Fuel Economy with LSTM Networks and Reinforcement Learning (full)

15:30 ↓ 17:00

Recurrent ANN 3 (REC3)

SESSION 21 ROOM C

Eleonora Giunchiglia, Anton Nemchenko, Mihaela van der Schaar
RNN-SURV: A Deep Recurrent Model for Survival Analysis (full)

Taisuke Kobayashi
Practical Fractional-order Neuron Dynamics for Reservoir Computing (full)

Giuseppe Marra, Andrea Zugarini, Stefano Melacci, Marco Maggini
An Unsupervised Character-aware Neural Approach to Word and Context Representation Learning (full)

Medical AI Systems 1 - Natural Language2 (MED1-NL2)

SESSION 22 ROOM D

Karima Ben-Suliman, Adam Krzyzak
Computerized Counting-based System for Acute Lymphoblastic Leukemia Detection in Microscopic Blood Images (full)

Olga Senyukova, Gregory Borodin
Right Ventricle Segmentation in Cardiac MR Images Using U-Net with Partly Dilated Convolution (full)

Xingzhang Ren, Leilei Zhang, Hang Hua, Wei Ye
Attention Enhanced Chinese Word Embeddings (full)

Kyrill Schmid, Lenz Belzner, Thomy Phan, Thomas Gabor
Action Markets in Deep Multi-Agent Reinforcement Learning (full)

Amy Nesky, Quentin Stout
Neural Networks with Block Diagonal Inner Product Layers (full)

Amy Nesky, Quentin Stout
Training Neural Networks Using Predictor-Corrector Gradient Descent (full)

Peter Gergeľ, Igor Farkaš
Investigating the Role of Astrocyte Units in a Feedforward Neural Network (full)

Mandar Tabib, Ole Martin Løvvik, Kjetil Johannessen, Adil Rasheed, Espen Sagvolden, Anne Marthine Rustad
Discovering Thermoelectric Materials Using Machine Learning: Insights and Challenges (full)

Antonios Karatzoglou, Nikolai Schnell, Michael Beigl
A Convolutional Neural Network Approach for Modeling Semantic Trajectories and Predicting Future Locations (full)

Qi Qi, Huang Yue
Breast Cancer Histopathological Image Classification via Deep Active Learning and Confidence Boosting (full)

Yingruo Fan, Jacqueline C.K. Lam, Victor O.K. Li
Multi-Region Ensemble Convolutional Neural Network for Facial Expression Recognition (full)

Lucas Kitano, Miguel Sousa, Sara Santos, Ricardo Pires, Maria Souza, Alexandre Campo
Epileptic Seizure Prediction from EEG Signals Using Unsupervised Learning and a Polling-based Decision Process (full)

Jian Hou, Aihua Zhang, Chengcong Lv, Xu E
A Target Dominant Sets Clustering Algorithm (full)

Slawomir Golak, Anna Jama, Marcin Blachnik, Tadeusz Wieczorek
New Architecture of Correlated Weights Neural Network for Global Image Transformations (full)

Adriana Mihaela Coroiu, Alina Delia Călin, Maria Nuțu
Communication Style - an Analysis from the Perspective of Automated Learning (short)

SAT6

09:00 → 14:00 **Registration**

09:30 ↓ 10:30

KEYNOTE 3 ROOM **A**

Multimodal Deep Learning In Biomedical Image Analysis

Sotirios Tsaftaris

Chair **Marios Polycarpou**

10:30 ↓ 12:00

SESSION 23 ROOM **A**

Convolutional Neural Networks 2 (CNN2)

Chair **Ikuko Nishikawa**

Nobuaki Hasuike, Yuko Osana
Learning Game by Profit Sharing using Convolutional Neural Network (full)

Yahaya Isah Shehu, Ariel Ruiz-Garcia, Vasile Palade, Anne James
Detection of Fingerprint Alterations Using Deep Convolutional Neural Networks (full)

Jiří Martínek, Ladislav Lenc, Pavel Král
Neural Networks for Multi-lingual Multi-label Document Classification (full)

Alex Hernández García, Peter König
Further Advantages of Data Augmentation on Convolutional Neural Networks (full)

SESSION 24 ROOM **B**

Robotics 2 (ROB2)

Chair **Pavel Král**

Sebastian Otte, Lea Hofmaier, Martin Butz
Integrative Collision Avoidance within RNN-driven Many-joint Robot Arms (full)

Rudolf Szadkowski, Jan Drchal, Jan Faigl
Terrain Classification with Crawling Robot using Long Short-term Memory Network (full)

Yuki Yamanaka, Takaharu Yaguchi, Kohei Nakajima, Helmut Hauser
Mass-spring Damper Array as a Mechanical Medium for Computation (full)

Michail Theofanidis, Saif Sayed Iftekar, Joe Cloud, James Brady, Fillia Makedon
Kinematic Estimation with Neural Networks for Robotic Manipulators (short)

12:00 → 12:30 **Coffee Break**

10:30 ↓ 12:00

SESSION 25 ROOM **C**

Recurrent ANN 4 (REC4)

Chair **Claudio Gallicchio**

Manfred Eppe, Tayfun Alpay, Stefan Wermter
Towards End-to-End Raw Audio Music Synthesis (full)

Amit Gajbhiye, Sardar Jaf, Noura Al Moubayed, Steven Bradley, Stephen McGough
An Exploration of Dropout with RNNs for Natural Language Inference (full)

Dongjie Zhang, Zheng Fang, Yanan Cao, Yanbing Liu, Xiaojun Chen
Attention-Based RNN Model for Joint Extraction of Intent and Word Slot Based on a Tagging Strategy (full)

Kirill Kochetov, Evgeny Putin, Maksim Balashov, Andrey Filchenkov, Anatoly Shalyto
Noise Masking Recurrent Neural Network for Respiratory Sound Classification (full)

SESSION 26 ROOM **D**

Fuzzy Logic 2 - Learning 3 (FUL2 - LEA3)

Chair **Basil Papadopoulos**

Francisco Carvalho, Lucas Santana, Marcelo Ferreira
Gaussian Kernel-based Fuzzy Clustering with Automatic Bandwidth Computation (full)

Jan Philip Göpfert, Heiko Wersing, Barbara Hammer
Mitigating Concept Drift via Rejection (full)

Innokentii Zhdanov, Oleg Shcherbakov, Alexey Potapov, Sergey Rodionov, Nikolay Skorobogatko
HyperNets and their Application to Learning Spatial Transformations (full)

Georgios Souliotis, Basil Papadopoulos
Fuzzy Implications Generating from Fuzzy Negations (full)

10:30 ↓ 12:00

**Full conference/workshop papers are assigned 20 minutes; short conference/workshop papers are assigned 15 minutes*

12:30 ↓ 13:45

SESSION 27 — ROOM A
Spiking Neural Networks 2 (SP2)

Chair **Antonis Papaleonidas**

Varun Bhatt, Udayan Ganguly
Sparsity Enables Data and Energy Efficient Spiking Convolutional Neural Networks (full)

Vincent Meganck, Lech Grzesiak
Spiking Signals in FOC Control Drive (full)

Muhammad Yaqoob, Borys Wróbel
Very Small Spiking Neural Networks Evolved for Temporal Pattern Recognition and Robust to Perturbed Neuronal Parameters (full)

Muhammad Aamir Khan, Volker Steuber, Neil Davey, Borys Wróbel
Spiking Neural Networks Evolved to Perform Multiplicative Operations (short)

SESSION 28 — ROOM B
Brain Inspired Computing 2 (BRIC2)

Chair **Alessandra Lintas**

Kazuki Tachikawa, Yuji Kawai, Jihoon Park, Minoru Asada
Effectively Interpreting Electroencephalogram Classification Using the Shapley Sampling Value to Prune a Feature Tree (full)

Athanasios Koutras, George Kostopoulos
EEG-based Person Identification Using Rhythmic Brain Activity During Sleep (full)

Jérémie Cabessa, Alessandro Villa
An STDP Rule for the Improvement and Stabilization of the Attractor Dynamics of the Basal Ganglia-Thalamocortical Network (full)

Vitor Tocci de Luca, Roseli Wedemann, Angel Plastino
Neuronal Asymmetries and Fokker-Planck Dynamics (short)

13:45 → 14:45 Lunch

15:30 → Rhodes Guided Tour

21:00 → Conference Party

12:30 ↓ 13:45

SESSION 29 — ROOM C
Learning 4 (LEA4)

Chair **Alberto Suárez**

Ivano Lauriola, Mirko Polato, Alberto Lavelli, Fabio Rinaldi, Fabio Aiolli
Learning Preferences for Large Scale Multi-Label Problems (full)

Ujjal Kr Dutta, Chandra Sekhar C
Affinity Propagation Based Closed-Form Semi-supervised Metric Learning Framework (full)

Myrianthi Hadjicharalambous, Marios Polycarpou, Christos Panayiotou
Online Approximation of Prediction Intervals Using Artificial Neural Networks (full)

Jessica Lopez-Hazas, Aaron Montero, Francisco Rodriguez
Pattern Recognition Strategies based on the Insect Olfactory System (short)

SESSION 30 — ROOM D
Classification 2 (CLA2)

Chair **Sylvain Chevallier**

Adrian Horzyk, Krzysztof Gołdon
Associative Graph Data Structures Used for Acceleration of K Nearest Neighbor Classifiers (full)

Jiří Martínek, Ladislav Lenc, Pavel Kral
Semantic Space Transformations for Cross-lingual Document Classification (short)

Guillermo Sarasa, Ana Granados, Francisco Rodriguez
Automatic Treatment of Bird Audios by Means of String Compression Applied to Sound Clustering in Xeno-Canto Database (short)

Alberto Suárez, Adrián Muñoz Perera
Directional Data Analysis for Shape Classification (full)

Evyatar Illouz, Eli (Omid) David, Nathan Netanyahu
Handwriting-based Gender Classification Using End-to-End Deep Neural Networks (short)

**Full conference/workshop papers are assigned 20 minutes; short conference/workshop papers are assigned 15 minutes*

SUN7

09:00 → 17:00 **Registration**

09:30 ↓ 10:30

KEYNOTE 4 ROOM **A**

On the Deep Learning R/Evolution in Computer Vision

Nathan Netanyahu

Chair **Vera Kurkova**

10:30 ↓ 12:00

SESSION 31 ROOM **A**

Deep Learning 6 (DEE6)

Chair **Nathan Netanyahu**

Benjamin Wulff, Jannis Schuecker, Christian Bauckhage
SPSA for Layer-wise Training of Deep Networks (full)

Matteo Tiezzi, Stefano Melacci, Marco Maggini, Angelo Frosini
Video Surveillance of Highway Traffic Events by Deep Learning Architectures (full)

Leon Bobrowski, Magdalena Topczewska
Dipolar Data Aggregation in the Context of Deep Learning (full)

Antreas Antoniou, Amos Storkey, Harrison Edwards
Augmenting Image Classifiers using Data Augmentation Generative Adversarial Networks (full)

SESSION 32 ROOM **B**

Convolutional Neural Networks 3 - WAVELET (CNN3-WAV)

Chair **Myrianthi Hadjicharalambous**

Stefan Oehmcke, Oliver Zielinski, Oliver Kramer
Direct Training of Dynamic Observation Noise with UMarineNet (full)

Kostas Delibasis, Ilias Maglogiannis, Spyros Georgakopoulos, Konstantina Kottari, Vassilis Plagianakos
Assessing Image Analysis Filters as Augmented Input to Convolutional Neural Networks for Image Classification (full)

Mark Sousa, Miguel Sousa, Emilio Hernandez
Balancing Convolutional Neural Networks Pipeline in FPGAs (full)

Alexander Efitorov, Sergey Dolenko, Vladimir Shiroky
A Neural Network of Multiresolution Wavelet Analysis (short)

12:00 → 12:30 **Coffee Break**

10:30 ↓ 12:00

SESSION 33 ROOM **C**

Spiking Neural Networks 3 - Hierarchical ANN (SP3 - HIE)

Chair **Jérémie Cabessa**

Shashwat Shukla, Sangya Dutta, Udayan Ganguly
Design of Spiking Rate Coded Logic Gates for C. elegans Inspired Contour Tracking (full)

Isabella Pozzi, Roeland Nusselder, Davide Zambrano, Sander Bohté
Gating Sensory Noise in a Spiking Subtractive LSTM (full)

Mohammad Hovaidi-Ardestani, Nitin Saini, Aleix Martinez, Martin Giese
Neural Model for the Visual Recognition of Animacy and Social Interaction (full)

Takayuki Fujita, Yuko Osana
Artwork Retrieval Based on Similarity of Touch Using Convolutional Neural Network (short)

SESSION 34 ROOM **D**

Machine Learning 3 - Bio Inspired ANN (MAL3 - BIOIN)

Chair **Roseli Wedemann**

Ingrid Grenet, Yonghua Yin, Jean-Paul Comet, Erol Gelenbe
Machine Learning to Predict Toxicity of Compounds (full)

Javier Cela, Alberto Suárez
Energy-Based Clustering for Pruning Heterogeneous Ensembles (full)

Josef Feigl, Martin Bogdan
Improved Personalized Rankings Using Implicit Feedback (full)

Aaron Montero, Jessica Lopez-Hazas, Francisco Rodriguez
Input Pattern Complexity Determines Specialist and Generalist Populations in Drosophila Neural Network (short)

**Full conference/workshop papers are assigned 20 minutes; short conference/workshop papers are assigned 15 minutes*

12:30 ↓ 14:00

SESSION 35 — Deep Learning 7 - Radial Basis Function ANN (DEE7 - RBF)
ROOM A

Chair **Stefan Oehmcke**

George Tsekouras, Ioannis Troumpis, Christos Kalloniatis, Panagiotis Papachiou, Dias Charalampopoulos
Modeling Data Center Temperature Profile in Terms of a First Order Polynomial RBF Network Trained by Particle Swarm Optimization (short)

Stanislaw Jastrzębski, Zachary Kenton, Devansh Arpit, Nicolas Ballas, Asja Fischer, Yoshua Bengio, Amos Storkey
Width of Minima Reached by Stochastic Gradient Descent is Influenced by Learning Rate to Batch Size Ratio (full)

Xia Xiao, Sanguthevar Rajasekaran,
PMGAN: A Novel Parallel Mix-Generator Generative Adversarial Network (full)

Savvas Karatsiolis, Christos Schizas, Nicolai Petkov
Modular Domain-to-Domain Translation Network (full)

SPECIAL SESSION — Interpretable Methods for Machine and Deep Learning (INM²DL)
ROOM B

Chair **Carlos Pena-Reyes**

Mirko Polato, Fabio Aiolli
A Game-theoretic Framework for Interpretable Preference and Feature Learning (full)

Rafet Sifa
An Overview of Frank-Wolfe Optimization for Stochasticity Constrained Interpretable Matrix and Tensor Factorization (full)

Stephane Gomez, Jérémie Despraz, Carlos Pena-Reyes
Improving Neural Network Interpretability via Rule Extraction (short)

14:00 → 15:00 — Lunch

15:00 ↓ 16:30

SESSION 38 — Deep Learning 10 - Medical AI Systems 2 (DEE10 - MED2)
ROOM B

Chair **Ladislav Lenc**

Hwei Geok Ng, Matthias Kerzel, Jan Mehnert, Arne May, Stefan Wermter
Classification of MRI Migraine Medical Data using 3D Convolutional Neural Network (full)

Reda Elbasiony, Walid Gomaa, Tetsuya Ogata
Deep 3D Pose Dictionary: 3D Human Pose Estimation from Single RGB Image Using a Deep Convolutional Neural Network (full)

12:30 ↓ 14:00

SESSION 36 — Deep Learning 8 (DEE8)
ROOM C

Chair **Sergey Dolenko**

Katia Huri, Eli (Omid) David, Nathan Netanyahu
DeepEthnic: Multi-Label Ethnic Classification from Face Images (short)

Anton Nemchenko, Trent Kyono, Mihaela van der Schaar
Siamese Survival Analysis with Competing Risks (full)

Giorgio Morales, Samuel Huamán, Joel Telles
Cloud Detection in High-Resolution Multispectral Satellite Imagery Using Deep Learning (full)

Kleanthis Malialis, Christos Panayiotou, Marios Polycarpou
Queue-based Resampling for Online Class Imbalance Learning (full)

SESSION 37 — Machine Learning 4 – DEEP9 (MAL4-DEE9)
ROOM D

Chair **Pavel Král**

Ricardo Pio Monti, Sina Tootoonian, Robin Cao
Avoiding Degradation in Deep Feed-Forward Networks by Phasing out Skip-Connections (full)

Amit Chaulwar, Michael Botsch, Wolfgang Utschick
Generation of Reference Trajectories for Safe Trajectory Planning (full)

Luiz Carlos da Silva, Cleber Gustavo Dias, Wonder Alexandre Luz Alves
A Histogram of Oriented Gradients for Broken Bars Diagnosis in Squirrel Cage Induction Motors (full)

Shirin Dora, Cyriel Pennartz, Sander Bohte
A Deep Predictive Coding Network for Inferring Hierarchical Causes Underlying Sensory Inputs (full)

15:00 ↓ 16:30

SESSION 39 — Deep Learning 11 (DEE11)
ROOM C

Chair **Ricardo Pio Monti**

Wenbin Jiang, Yangsong Zhang, Pai Liu, Geyan Ye, Hai Jin
FiLayer: A Novel Fine-Grained Layer-Wise Parallelism Strategy for Deep Neural Networks (full)

Debasmit Das, George Lee
Graph Matching and Pseudo-label Guided Deep Unsupervised Domain Adaptation (full)

SESSION 40 — Fuzzy Logic3 - Deep Learning 12 (FUZ3- DEE12)
ROOM D

Chair **Shirin Dora**

Zheng Wang, Irena Koprinska,
Solar Power Forecasting Using Dynamic Meta-Learning Ensemble of Neural Networks (short)

Pablo de Viña, Gonzalo Martínez-Muñoz,
Using Bag-of Little Bootstraps for Efficient Ensemble Learning (short)

**Full conference/workshop papers are assigned 20 minutes; short conference/workshop papers are assigned 15 minutes*

15:00 ↓ 16:30

SESSION 38 ROOM **B**

Deep Learning 10 - Medical AI Systems 2 (DEE10 - MED2)

Daniel Gibert, Carles Mateu, Jordi Planes
An End-to-End Deep Learning Architecture for Classification of Malware's Binary Content (short)

Catalina Hernandez, Sergio Villagran, Paulo Alonso Gaona-Garcia, Johan Ortiz
Model Based on Support Vector Machine for the Estimation of the Heart Rate Variability (short)

16:30 → 17:00 Coffee Break

16:30 → 18:00 ROOM **A**

Poster Session B

Thibaut Kulak, Michael Garcia Ortiz
Emergence of Sensory Representations using Prediction in Partially Observable Environments (full)

Lynn Houthuys, Johan Suykens
Tensor Learning in Multi-View Kernel PCA (full)

Zahra Karevan, Lynn Houthuys, Johan Suykens
Weighted Multi-view Deep Neural Networks for Weather Forecasting (full)

Gustavo Pessin, Joao Olegario Souza, Rodrigo Marques de Figueiredo, Jose Vicente Canto dos Santos
Real-Time Hand Prosthesis Biomimetic Movement Based on Electromyography Sensory Signals Treatment and Sensors Fusion (full)

Junyu Liu, Yang Liu, Xiangfei Chai, Bowen Meng, Cheng Wang, Yanhui Zhang, Panli Zuo
An Original Neural Network for Pulmonary Tuberculosis Diagnosis in Radiographs (full)

Zongren Li, Yijie Wang, Guohong Zhao, Li Cheng, Xingkong Ma
FROD: Fast and Robust Distance-based Outlier Detection with Active-Inliers-Patterns in Data Streams (full)

Alessandra Lintas, Alessandro Villa, Yoshiyuki Asai, Takeshi Abe
Granger Causality to Reveal Functional Connectivity in the Mouse Basal Ganglia-Thalamocortical Circuit (full)

Parisa Rastin, Guénaël Cabanes, Basarab Matei, Jean-Marc Marty
Change Detection in Individual Users' Behavior (full)

Philipp Kuhlmann, Paul Sanzenbacher, Sebastian Otte
Online Carry Mode Detection for Mobile Devices with Compact RNNs (full)

Xerxes Arsiwalla, Daniel Pacheco, Alessandro Principe, Rodrigo Rocamora, Paul Verschure
A Temporal Estimate of Integrated Information for Intracranial Functional Connectivity (full)

Najem Abdennour, Abir Hadriche, Tarek Frikha, Nawel Jmail
Extraction and Localization of Non-Contaminated Alpha and Gamma Oscillations from EEG Signal Using Finite Impulse Response, Stationary Wavelet Transform, and Independent Component Analysis (full)

18:00 → 18:15 Closing Session

15:00 ↓ 16:30

SESSION 39 ROOM **C**

Deep Learning 11 (DEE11)

Mihailo Isakov, Michel Kinsy
NoSync: Particle Swarm Inspired Distrbuted DNN Training (full)

SESSION 40 ROOM **D**

Fuzzy Logic3 - Deep Learning 12 (FUZ3- DEE12)

Niloofar Azizi, Hafez Farazi, Sven Behnke
Location Dependency in Video Prediction (short)

Lazaros Iliadis, Serafeim Koutsomplias
Soft Computing Modeling of the Illegal Immigration Density in the Borders of Greece (full)

Mark Collier, Joeran Beel
Implementing Neural Turing Machines (full)

Kristína Malinovská, Ľudovít Malinovský, Igor Farkaš
Towards More Biologically Plausible Error-Driven Learning for Artificial Neural Networks (short)

Jan Kronenberger, Anselm Haselhoff
Do Capsule Networks Solve the Problem of Rotation Invariance for Traffic Sign Classification? (short)

Haigen Hu, Kangjie Li, Qiu Guan, Feng Chen, Shengyong Chen
A Multi-channel Multi-classifier Method for Classifying Pancreatic Cystic Neoplasms Based on ResNet (short)

René Larisch, Michael Teichmann, Fred Hamker
A Neural Spiking Approach Compared to Deep Feedforward Networks on Stepwise Pixel Erasement (short)

Antoni Mauricio, Gerson Vizcarra
A Deep Learning Approach for Sentiment Analysis in Spanish Tweets (short)

Antoni Mauricio, Jorge López C, Roger Huauya and José Diaz
High-Resolution Generative Adversarial Neural Networks Applied to Histological Images Generation (short)

Youcai Zhang, Yiwei Gu, Xiaodong Gu
Two-Stream Convolutional Neural Network for Multimodal Matching (short)

Chama Bensmail, Volker Steuber, Neil Davey, Borys Wróbel
Spiking Neural Network Controllers Evolved for Animat Foraging Based on Temporal Pattern Recognition in the Presence of Noise on Input (short)

David Coufal
Superkernels for RBF Networks Initialization (short)

**Full conference/workshop papers are assigned 20 minutes; short conference/workshop papers are assigned 15 minutes*

SOCIAL PROGRAM

Thursday 4/10	21:00	**Welcome Reception**
Saturday 6/10	15:30	**Rhodes Guided Tour**
Saturday 6/10	21:00	**Conference Party**

LOCAL INFO

Conference Venue

Aldemar Amilia Mare
Kallithea, Rhodes, Greece, 85 100
Tel: +30 22410 54 400 / Fax: +30 22410 66 066

Emergency numbers

Police 100 • Fire brigade 199 • Ambulance 166

Telephone directory enquiries

Local 11888

Taxi Companies

Radiotaxi (in Rhodes Town) +30 22410 69800
Radiotaxi (out of Rhodes Town) +30 22410 69600
Diagoras +30 22410 66555

Rhodes Airport

Phone Centre +30 22410 88700, 88701

Municipality of Rhodes Department of Tourism

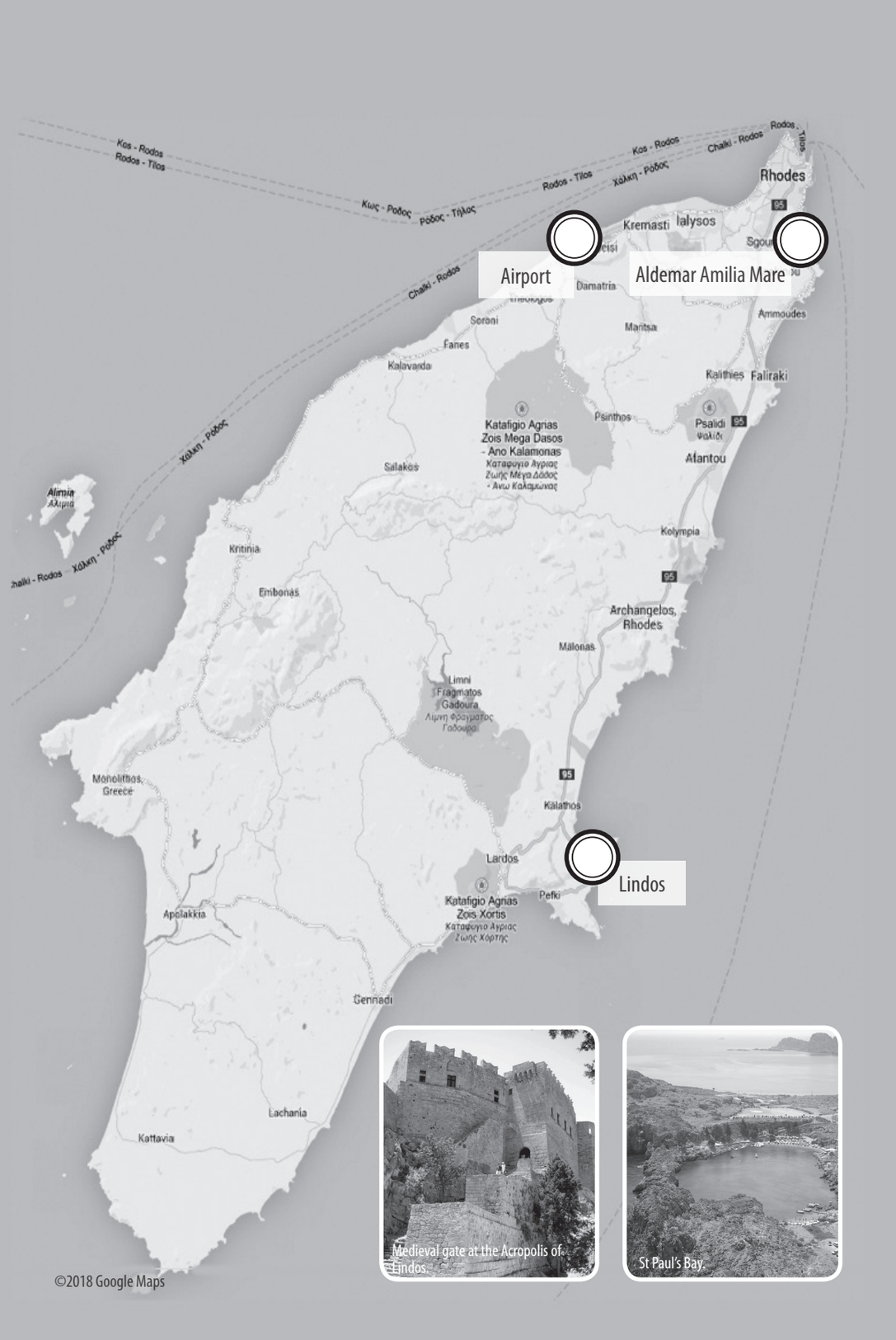
3, Averof, 851 00 Rhodes
Tel: +30 22410 35240, 35945

Greek National Tourism Organisation (EOT)

1, Ethnarhou Makariou Street and Papagou Street, 851 00 Rhodes
Phone center +30 22410 44333
Information: 171 (applicable inside Greece)

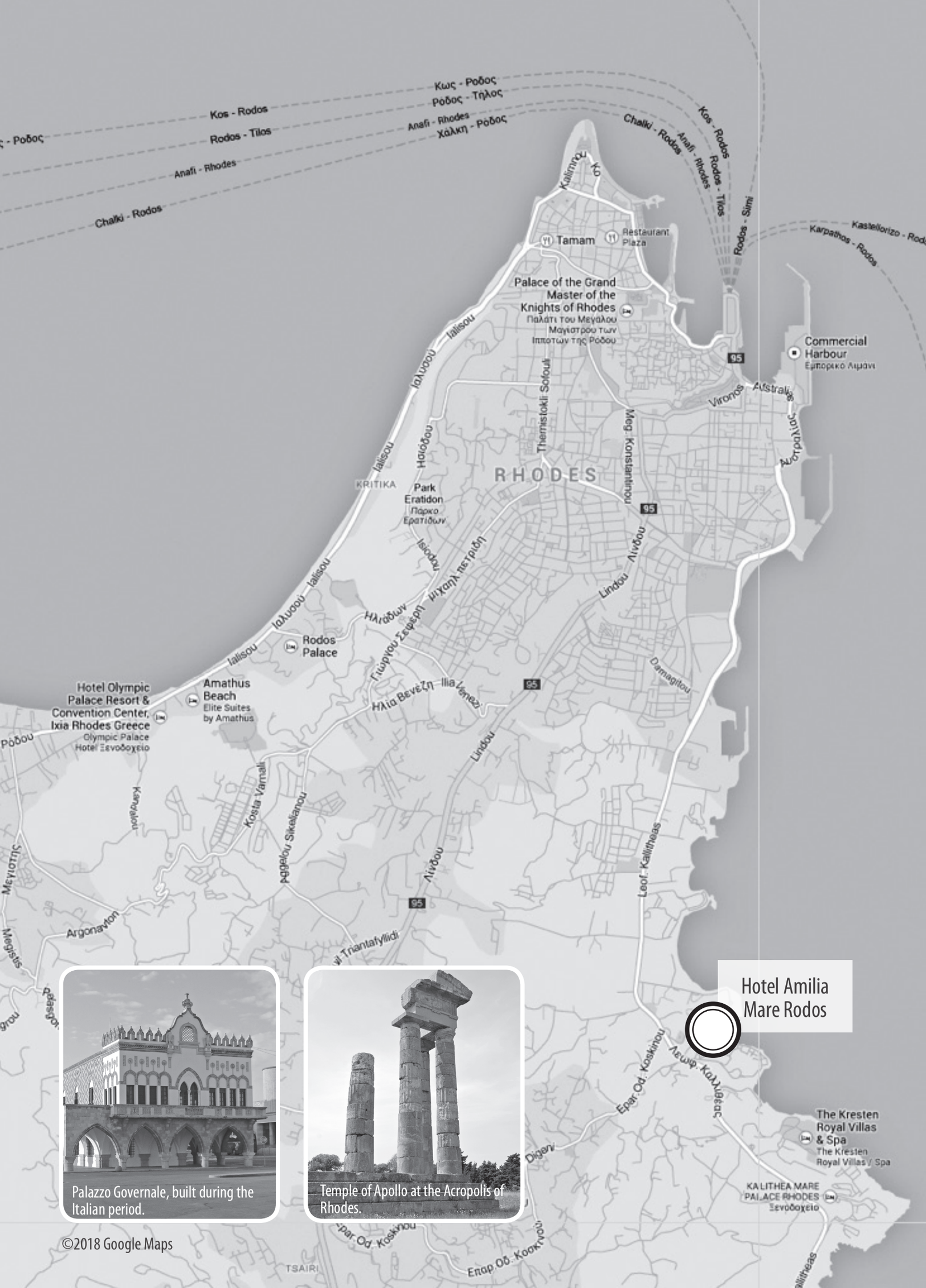
Tourist Police

1, Ethnarhou Makariou Street and Papagou Street, 851 00 Rhodes
Phone center +30 22410 27423 • Information: 171 (call inside Greece)



Medieval gate at the Acropolis of Lindos.

St Paul's Bay.



Palazzo Governale, built during the Italian period.

Temple of Apollo at the Acropolis of Rhodes.