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22nd International Conference on Engineering Applications of Neural Networks 25-27 June 2021

Held LIVE electronically!
eann2021.eu

EANN 2021/to change as: EAAAI Engineering Applications & Advances of Artificial Intelligence INNS Conference

KEYNOTE SPEAKERS

John Macintyre, University Sunderland UK

Hojjat Adeli, Ohio State University, Columbus, USA

Antonis Argyros, University of Crete, Greece

Peter Tino, University of Birmingham, UK

Johan Suykens, KU Leuven, ESAT-Stadius and Leuven.AI Institute, Belgium

Nikola Kasabov, Auckland University of Technology, New Zealand

Eunika Mercier-Laurent, Université de Reims Champagne-Ardenne, France

Jose Principe, University of Florida, USA

GENERAL CHAIRS

Chrisina Jayne, Teeside University, UK

John Macintyre, University of Sunderland, UK

PROGRAM CHAIRS

Lazaros Iliadis, Democritus University of Thrace, Greece

Ilias Maglogiannis, University of Piraeus, Greece

Costin Badica, University of Craiova, Romania

HONORAY CHAIRS

Plamen Angelov, University of Lancaster, UK

Vera Kurkova, Czech Academy of Sciences

TUTORIALS

Vangelis Metsis, Texas State University, USA

SUBJECT: Modern methods and tools for human biosignal analysis

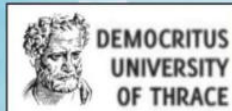
Giacomo Boracchi, Politecnico di Milano, Italy

SUBJECT: Anomaly Detection in Images

WORKSHOPS

1st Workshop on
AI & ETHics (AIETH 21)

1st Workshop on
Energy Efficiency and AI (EEAI)



Engineering Application of Neural Networks

**(to be renamed to EAAAI-Engineering Applications and Advances
of Artificial Intelligence)**

22nd International Conference EANN 2021

Greece, 25 – 27 June 2021

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22nd EANN / (will change to EAAAI) 2021

Artificial Neural Networks (ANN) are a typical case of Machine Learning, which mimics the physical learning process of the human brain. More than 60 years have passed from the introduction of the first Perceptron. Since then, numerous types of NN architectures (e.g., Deep Learning-DL) have been developed. DL has found a variety of applications in numerous timely domains, like *Self Driving cars, Fraud-Fake News Detection, Virtual Assistants, Image Analysis, Natural Language*. Convolutional Neural Networks (a case of Deep Neural Network) are used in various domains, mainly in image recognition, document analysis, Biomedical systems).

The technology of NN is progressing rapidly and we understand that there is no limit in their applications. However, we have not managed to fully simulate the human brain so far. Research both on theory and practice is advancing and the international scientific community is seen novel achievements all the time. At the same time there are more and more concerns on Ethics as far as our way of life is influenced. Our conference is a step towards capturing and disseminating all the innovations and challenges associated with Artificial intelligence (AI).

Engineering Applications of Neural Networks (EAN) is a mature and well established international scientific conference, that has been held all over Europe for the last 26 years. It has a continuous and dynamic presence as a major, global, but mainly European scientific event. More specifically, it has been organized in Finland, UK (England), Sweden, Gibraltar, Poland, Italy, Spain, France, Bulgaria, UK (Scotland) UK (Bristol) and Greece. It has been technically supported by the International Neural Networks Society (INNS) and more specifically by the EANN Special Interest Group. Its history is long and very successful, following and spreading the evolution of Intelligent Systems.

The first EANN was organized in 1995 in *Otaniemi Finland*, providing a great discussion forum on AI technologies, focusing on ANN. Since 1995, this great international event, keeps promoting the use of modeling techniques from all subdomains of Artificial Intelligence, in diverse application areas, where significant benefits can be derived. The conference is also reporting advances on respective theoretical frameworks. After 26 years of presence in the international literature, it keeps bringing together scientists from all AI domains, giving them the chance to exchange ideas and to announce their scientific advances on both theoretical and application level.

The year 2021 is going to be a milestone and it is going to be remembered as the year of positive changes. The Steering Committee has decided that the name of the conference, should reflect the content of the scientific areas it covers. Thus, from 2022 its name should change to *Engineering Applications and Advances of Artificial Intelligence* (EAAAI). During a transitional period, the name will be *EAAAI (ex EANN)* conference.

In 2021, a year characterized by the pandemic of the COVID-19, two historic events have decided to join their forces. The 22nd EANN 2021 has been collocated with the 17th AIAI 2021 conference.

The Proceedings' volume belongs to INNS (International Neural Networks) Springer Series and it contains the papers that were accepted to be presented orally at the 22nd EANN 2021. The diverse nature of papers presented, demonstrates the vitality of Artificial Intelligence algorithms and approaches. It is not only related to Neural Networks, but it certainly provides a very wide forum for AI applications as well.

The event was held from the 25th to the 27th of June 2021 via webex events.

Regardless the extremely difficult pandemic conditions, the response of the international scientific community to the EANN 2021 call for papers was more than satisfactory, with 83 papers initially submitted. All papers were peer reviewed by at least two independent academic referees. Where needed a third referee was consulted to resolve any potential conflicts. A total of 48.2% of the submitted manuscripts (40 papers) have been accepted to be published as Full papers (12 pages long) in the Springer proceedings. Due to the high quality of the submissions, the Program Committee has decided that it should accept additionally 1 more paper to be published as short one (10 pages long).

Professor Lazaros Iliadis

School of Engineering, Head of the Department of Civil Engineering, Sector of Mathematics, Programming and GC, Lab of Mathematics and Informatics ISCE, Democritus University of Thrace, Greece

Professor Elias Pimenidis

Program Leader Computer Science, Department FET-Computer Science and Creative Technologies, University of the West of England, Bristol, UK

Professor John Macintyre,

Pro Vice Chancellor, University of Sunderland, School of Computing and Technology, UK

Professor Chrisina Jayne,

School of Computing, Engineering & Digital Technologies, Teesside University, UK

22nd EANN 2021 KEYNOTE LECTURES

Eight keynote speakers gave state of the art lectures (after invitation) in timely aspects-applications of Artificial Intelligence.

The following talks were given:

1. **Professor John Macintyre:** Pro Vice Chancellor at the University of Sunderland, UK gave a Keynote Lecture on a very hot topic related to AI and Ethics.

Title: “Is “Big Tech” Becoming the “Big Tobacco” of Artificial Intelligence?”



Abstract:

Recent developments in research, development, implementation and use of AI include worrying trends which ask big questions about the future direction of the whole field. As part of this, the role of “Big Tech” – the huge corporate entities who now dominate the development of AI technologies and products – is crucial, both in terms of the technology they develop, and the researchers they employ. Their dominance places them at the apex of the R&D and product development activity in AI, which in turn means they have a great responsibility to ensure that this activity leads to fair, transparent, accountable, and ethical AI systems and products. They also have a great responsibility to support and nurture their staff. This talk will examine recent developments in AI and the role of Big Tech, and ask whether they are stepping up to these responsibilities.

Biography:

Professor John MacIntyre is Pro Vice Chancellor at the University of Sunderland. He did his doctorate in Applied Artificial Intelligence in the early 1990s, and went on to establish the Centre for Adaptive Systems which became recognized by the UK Government as a Centre of Excellence in Applied AI. He has published more than 170 papers and given numerous keynote presentations at events around the world. He is the Editor-in-Chief of Neural Computing & Applications, a role he has held since 1996. NC&A publishes peer-reviewed original research on applied AI, receiving over 4,000 submissions in 2020. John is also Co Editor-in-Chief of a new journal, AI and Ethics, which he established with Professor Larry Medsker, of George Washington University this year. The first original research and thought leadership pieces were published online in AI and Ethics in October 2020, and the journal is now making a significant contribution to the public debate on the future direction of AI.

2. **Prof. Hojjat Adeli:** Ohio State University, Columbus, USA, Fellow of the Institute of Electrical and Electronics Engineers (IEEE) (IEEE), Honorary Professor, Southeast University, Nanjing, China, Member, Polish and Lithuanian Academy of Sciences, Elected corresponding member of the Spanish Royal Academy of Engineering.

Title: “Machine Learning: A Key Ubiquitous Technology in the 21st Century”



Abstract:

Machine learning (ML) is a key and increasingly pervasive technology in the 21st century. It is going to impact the way people live and work in a significant way. In general, machine learning algorithms simulate the way brain learns and solves an estimation/recognition problem. They usually require a learning phase to discover the patterns among the available data, similar to the humans. An expanded definition of ML is advanced as algorithms that can learn from examples and data and solve seemingly intractable learning and unteachable problems, referred to as ingenious artificial intelligence (AI). Recent and innovative applications of ML in various fields and projects currently being pursued by leading high-tech and industrial companies such as Boeing, Google, IBM, Uber, Baidu, Facebook, and Tesla are reviewed. Then, machine learning algorithms developed by the author and his associates are briefly described. Finally, examples are presented in different areas from health monitoring of smart high-rise building structures to automated EEG-based diagnosis of various neurological and psychiatric disorders such as epilepsy, the Alzheimer’s disease, Parkinson’s disease, and autism spectrum disorder.

Short Bio:

Hojjat Adeli received his Ph.D. from Stanford University in 1976 at the age of 26. He is currently an Academy Professor at The Ohio State University where he held the Abba G. Lichtenstein Professorship for ten years. He is the Editor-in-Chief of the international journals Computer-Aided Civil and Infrastructure Engineering which he founded in 1986 and Integrated Computer-Aided Engineering which he founded in 1993. He has also served as the Editor-in-Chief of the International Journal of Neural Systems since 2005. He has been an Honorary Editor, Advisory Editor, or member of the Editorial Board of 144 research journals. He has authored over 600 research and scientific publications in various fields of computer science, engineering, applied mathematics, and medicine, including 16 ground-breaking high-technology books. He is the recipient of over sixty-five awards and honors including five Honorary Doctorates, and Honorary Professorship at several Asian and European Universities. He is a member of Academia Europaea, a corresponding member of the Spanish Royal Academy of Engineering, a foreign member of Lithuanian Academy of Sciences and Polish Academy of Science, a Distinguished Member of American Society of Civil Engineers (ASCE), and a Fellow of AAAS, IEEE,

AIMBE, and American Neurological Association. He was profiled as an Engineering Legend in the journal Leadership and Management in Engineering, ASCE, April 2010, by a noted biographer of legendary engineer Infrastructure.

3. **Prof. Antonis Argyros:** Professor and Chair, Computer Science Department, University of Crete, Greece.

Researcher, Foundation for Research and Technology – Hellas (FORTH)

Title: Human-Centered Computer Vision: Core Components and Applications



Abstract:

Computer vision is an area of artificial intelligence aimed at developing technical systems capable of perceiving the environment through image and video processing and analysis. In this talk, we mainly focus on human-centered computer vision, that is, computer vision for capturing aspects of human presence such as the geometry and motion of the human body, as well as for recognizing human actions, behavior, intentions and emotional states. Such technologies may constitute a fundamental building block for the development of a variety of applications in almost all aspects of human life (health, security, work, education, transportation, entertainment, etc.). In this special area, we give specific examples of our research activity and highlight the significant boost achieved due to the exploitation of state-of-the-art machine learning techniques and deep neural networks. We also give examples of applications developed based on these technologies in the field of robotics and ambient intelligence environments.

Short Bio:

Antonis Argyros is a Professor of Computer Science at the Computer Science Department (CSD), University of Crete (UoC) and a researcher at the Institute of Computer Science (ICS), Foundation for Research and Technology-Hellas (FORTH) in Heraklion, Crete, Greece. His current research interests fall in the areas of computer vision and pattern recognition, 3D reconstruction, image motion and tracking, with emphasis on human body pose and shape analysis and recognition of human activities and gestures. He is also interested in applications of computer vision in the fields of robotics and smart environments. In these areas, he has published more than 180 papers in scientific journals and refereed conference proceedings and has delivered several invited and keynote talks in international events, universities and research centers. Antonis Argyros has served as a general co-chair of ECCV'10, as a Program Co-chair of IEEE FG'20, ICVS'19, as a co-founder and co-organizer of the HANDS'15, '17, '18, '19 series of workshops, and

as an Area Chair/Area Editor/Associate Editor of several editions for top vision, robotics and signal processing conferences (ICCV, ECCV, BMVC, ICPR, ICRA, IROS, EUSIPCO). He serves as a member of the Advisory Board of the IET Image Processing journal and as an Area Editor for the Computer Vision and Image Understanding Journal (CVIU). He has served as a member of the Editorial Board of the IEEE Robotics and Automation Letters journal, as a reviewer in more than 35 journals and as a TPC member of more than 70 conferences in computer vision, computer graphics, robotics and related disciplines. Since 1999, Antonis Argyros he has been involved in more than 30 European and national RTD projects on computer vision, pattern recognition, image analysis and robotics.

4. **Prof. Peter Tino:** School of Computer Science, University of Birmingham, UK

Title: Unveiling Recurrent Neural Networks - What Do They Actually Learn and How?



Abstract:

When learning from "dynamic" data where the order in which the data is presented does matter, the key issue is how such temporal structures get represented within the learning machine. In the case of artificial neural networks, an often-adopted strategy is to introduce feedback-connections with time delays. This enables the neurons to form their activation patterns based on the past, as well as the current neural activations. Neural networks of this kind became known as Recurrent Neural Networks (RNN). Many diverse architectures fall under this umbrella, with a wide variety of application domains. We will briefly review past attempts to understand the way RNNs learn to represent the past in order to perform the tasks they are trained on.

To that end, we will adopt the general view of RNNs as parameterized state space models and input driven non-autonomous dynamical systems. We will then present some new results connecting RNNs to a widely known class of models in machine learning - kernel machines. In particular, we will show that RNNs can be viewed as "temporal feature spaces". This framework will enable us to understand how high-dimensional RNNs constructed with very few degrees of freedom in their parameterization can still achieve competitive performances. Such observations can be viewed as "dynamical analogs" to classical "static" kernel machines that often achieve excellent performance using rich feature spaces constructed with very few degrees of freedom (e.g. single scale parameter in Gaussian kernels).

Short Bio:

Peter Tino holds a Chair position in Complex and Adaptive Systems at the School of Computer Science, University of Birmingham, UK. His interests span machine learning,

neural computation, probabilistic modelling and dynamical systems. Peter is fascinated by the possibilities of cross-disciplinary blending of machine learning, mathematical modelling and domain knowledge in a variety of scientific disciplines ranging from astrophysics to bio-medical sciences.

He has served on editorial boards of a variety of journals including IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Cybernetics, Scientific Reports, and Neural Computation and (co-)chaired Task Force on Mining Complex Astronomical Data and Neural Networks Technical Committee (TC of IEEE Computational Intelligence Society). Peter led an EPSRC-funded consortium of six UK universities on developing new mathematics for personalized healthcare. He was a recipient of the Fulbright Fellowship to work at NEC Research Institute, Princeton, USA, on dynamics of recurrent neural networks, UK–Hong-Kong Fellowship for Excellence, three Outstanding Paper of the Year Awards from the IEEE Transactions on Neural Networks and the IEEE Transactions on Evolutionary Computation, and the Best Paper Award at ICANN 2002.

5. Prof. Dr.ir. Johan Suykens: KU Leuven, ESAT-Stadius and Leuven AI Institute, Belgium

Title: Deep learning and Kernel Machines



Abstract:

Over the last decades, with neural networks and deep learning, several powerful architectures have been proposed, including e.g., convolutional neural networks (CNN), stacked autoencoders, deep Boltzmann machines (DBM), deep generative models and generative adversarial networks (GAN). On the other hand, with support vector machines (SVM) and kernel machines, solid foundations in learning theory and optimization have been achieved. Within this talk, we outline a unifying picture and show several new synergies, for which model representations and duality principles play an important role. A recent example is restricted kernel machines (RKM), which connects least squares support vector machines (LS-SVM) to restricted Boltzmann machines (RBM). New developments on this will be shown for deep learning, generative models, multi-view and tensor-based models, latent space exploration, robustness and explainability.

Short Bio: Johan A.K. Suykens was born in Willebroek Belgium, May 18 1966. He received his MSc degree in Electro-Mechanical Engineering and the PhD degree in Applied Sciences from the Katholieke Universiteit Leuven, in 1989 and 1995, respectively. In 1996 he has been a Visiting Postdoctoral Researcher at the University of California, Berkeley. He has been a Postdoctoral Researcher with the Fund for Scientific Research FWO

Flanders and is currently a full Professor with KU Leuven. He is author of the books “Artificial Neural Networks for Modelling and Control of Non-linear Systems” (Kluwer Academic Publishers) and “Least Squares Support Vector Machines” (World Scientific), co-author of the book “Cellular Neural Networks, Multi-Scroll Chaos and Synchronization” (World Scientific) and editor of the books “Nonlinear Modeling: Advanced Black-Box Techniques” (Kluwer Academic Publishers), “Advances in Learning Theory: Methods, Models and Applications” (IOS Press) and “Regularization, Optimization, Kernels, and Support Vector Machines” (Chapman & Hall/CRC). In 1998 he organized an International Workshop on Nonlinear Modelling with Time-series Prediction Competition. He has served as associate editor for the IEEE Transactions on Circuits and Systems (1997-1999 and 2004-2007), the IEEE Transactions on Neural Networks (1998-2009), the IEEE Transactions on Neural Networks and Learning Systems (from 2017) and the IEEE Transactions on Artificial Intelligence (from April 2020). He received an IEEE Signal Processing Society 1999 Best Paper Award, a 2019 Entropy Best Paper Award and several Best Paper Awards at International Conferences. He is a recipient of the International Neural Networks Society INNS 2000 Young Investigator Award for significant contributions in the field of neural networks. He has served as a Director and Organizer of the NATO Advanced Study Institute on Learning Theory and Practice (Leuven 2002), as a program co-chair for the International Joint Conference on Neural Networks 2004 and the International Symposium on Nonlinear Theory and its Applications 2005, as an organizer of the International Symposium on Synchronization in Complex Networks 2007, a co-organizer of the NIPS 2010 workshop on Tensors, Kernels and Machine Learning, and chair of ROKS 2013. He has been awarded an ERC Advanced Grant 2011 and 2017, and has been elevated IEEE Fellow 2015 for developing least squares support vector machines. He is currently serving as program director of Master AI at KU Leuven.

6. **Prof. Eunika Mercier-Laurent**, Université de Reims Champagne-Ardenne, CReSTIC/MODECO

Title: How can Artificial Intelligence efficiently support Sustainable Development?



Abstract:

This talk considers the multiple role AI may play in sustainability. Actually, sustainable development is among the greatest challenges for humanity. Sustainability and development are apparently opposite. The current efforts to face the Planet Crisis by separate actions generate less impact than expected. Artificial Intelligence approaches and capacity of available technologies are underexplored. Eco-innovation actions focus

mainly on smart transportation, smart use of energy and water and waste recycling but do not consider the necessary evolution of behaviors and focus. The trendy Digital transformation follows mostly traditional approaches. The concepts such as Smart, Intelligent, Innovative, Green or Wise City invented to promote existing technology transform the IT market. Most of offers consist in data processing with statistical/optimization methods. But AI can do better – the AI approaches and techniques combined with adequate thinking may help innovating the way of facing Planet Crisis.

Short Bio:

Eunika Mercier-Laurent is electronic engineer, PhD in computer science, expert in artificial intelligence, associate researcher with University of Reims Champagne Ardennes and Professor at EPITA International Masters and SKEMA. She has over 15 years of involvement with IFIP including the Chair position of Technical Committee 12 on Artificial Intelligence since 2019 and Chair of WG 12.6 (AI for Knowledge Management). She was elected representative of TC12 in France in 2018. Her teaching and MOOC includes Knowledge Management & Innovation powered by AI, Ethical Development of AI Systems, Innovation Ecosystems and Innovation Week Challenges. After working as researcher in INRIA, computers designer and manager of innovative AI applications with Groupe Bull, she founded Global Innovation Strategies devoted to all aspects of Knowledge Innovation. Among her research topics are: Knowledge and Eco-innovation Management Systems, methods and techniques for innovation, knowledge modelling and processing, complex problem solving, AI for sustainability, eco-design and impacts of artificial intelligence. She is President of Innovation3D, International Association for Global Innovation, expert for EU programs, member of Managing Body of the EU K4I (<https://www.knowledge4innovation.eu>) and author of over hundred scientific publications and books. Among the last “The Innovation Biosphere, Planet and Brains in Digital Era” and Intelligence in energy (co-authored with G. Kayakutlu).

7. Prof. Jose C. Principe, University of Florida

Title: Backpropagation Free Deep Learning



Abstract:

This talk presents recent results that show the feasibility of training deep networks classifiers without backpropagation. We will prove that it is possible to substitute error propagation in general conditions and practically achieve the same performance as conventional algorithms. This methodology allows modularization of the algorithmic

pipeline and improves explainability. We will then address some of the benefits of this technology for applications.

Short Bio:

Jose C. Principe (M'83-SM'90-F'00) is a Distinguished Professor of Electrical and Computer Engineering and Biomedical Engineering at the University of Florida where he teaches advanced signal processing, machine learning and artificial neural networks (ANNs) modeling. He is Eckis Endowed Professor and the Founder and Director of the University of Florida Computational Neuro-Engineering Laboratory (CNEL) www.cnel.ufl.edu. The CNEL Lab has been studying signal and pattern recognition principles based on information theoretic criteria (entropy and mutual information).

Dr. Principe is an IEEE, IABME, AIMBE Fellow. He was awarded the IEEE Neural Network Pioneer Award, the IEEE Shannon Nyquist Technical Achievement Award from the Signal Processing Society, the EMBS Career Achievement Award, and the Teacher Scholar of the Year from the U. of Florida. He was the past Chair of the Technical Committee on Neural Networks of the IEEE Signal Processing Society, Past-President of the International Neural Network Society, and Past-Editor in Chief of the IEEE Transactions on Biomedical Engineering. Dr. Principe has more than 800 publications. He directed 102 Ph.D. dissertations and 65 Master theses. He wrote in 2000 an interactive electronic book entitled "Neural and Adaptive Systems" published by John Wiley and Sons and more recently co-authored several books on "Brain Machine Interface Engineering" Morgan and Claypool, "Information Theoretic Learning", Springer, and "Kernel Adaptive Filtering", Wiley.

8. **Prof. Nikola Kasabov**, Fellow IEEE, Fellow RSNZ, Fellow INNS College of Fellows
Fellow IEEE, Fellow RSNZ, Fellow INNS College of Fellows
Professor of Knowledge Engineering and Founding Director KEDRI
Auckland University of Technology, Auckland, New Zealand,
George Moore Chair/Professor, University of Ulster, UK,
Honorary Professor Teesside University UK and the University of Auckland, NZ
Honorary Professor Teesside University UK and the University of Auckland, NZ
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This talk presents recent results that show the feasibility of training deep networks classifiers without backpropagation. We will prove that it is possible to substitute error propagation in general conditions and practically achieve the same performance as

conventional algorithms. This methodology allows modularization of the algorithmic pipeline and improves explainability. We will then address some of the benefits of this technology for applications.

Short Bio:

Professor Nikola Kasabov is Fellow of IEEE, Fellow of the Royal Society of New Zealand, Fellow of the INNS College of Fellows, DVF of the Royal Academy of Engineering UK. He is the Founding Director of KEDRI and Professor at the School of Engineering, Computing and Mathematical Sciences at Auckland University of Technology. Kasabov is a Past President of the Asia Pacific Neural Network Society (APNNS) and the International Neural Network Society (INNS). He is member of several technical committees of IEEE Computational Intelligence Society and Distinguished Lecturer of IEEE (2012-2014). He is Editor of Springer Handbook of Bio-Neuro-informatics, Springer Series of Bio-and Neuro-systems and Editor-in-Chief of the Springer journal Evolving Systems. He is Associate Editor of several international journals. Kasabov holds MSc and PhD from TU Sofia, Bulgaria. His main research interests are in the areas of neural networks, intelligent information systems, soft computing, bioinformatics, neuro-informatics. He has published more than 650 publications. He has extensive academic experience at various academic and research organizations in Europe and Asia, including George Moore Chair in Data Analytics at the University of Ulster; Professor at the University of Otago, NZ; Advisory Professor at Shanghai Jiao Tong University; Visiting Professor at ETH/University of Zurich and Robert Gordon University UK, Honorary Professor at the University of Auckland and Teesside University. Prof. Kasabov has received a number of awards, among them: Doctor Honoris Causa from Obuda University, Budapest; INNS Ada Lovelace Meritorious Service Award; NN Best Paper Award for 2016; APNNA 'Outstanding Achievements Award'; INNS Gabor Award for 'Outstanding contributions to engineering applications of neural networks'; EU Marie Curie Fellowship; Bayer Science Innovation Award; APNNA Excellent Service Award; RSNZ Science and Technology Medal; 2015 AUT Medal; Honorable Member of the Bulgarian, the Greek and the Scottish Societies for Computer Science. More information of Prof. Kasabov can be found on the web site: <https://academics.aut.ac.nz/nkasabov>

22nd EANN 2021 WORKSHOPS

Two workshops have been organized in the 22nd EANN 2021.

– **The 1st Workshop on AI and Ethics (AIETH 2021)**.....

Coordinator: Professor John Macintyre

Pro Vice chancellor at the University of Sunderland, United Kingdom



We should aim in responsible global AI, however at the same time we must be preparing to act preemptively and ensure that our societies will avoid negative effects of AI and of 4th Industrial Revolution in general. The workshop on AI Ethics was organized by the University of Sunderland, United Kingdom and it will discuss potential major ethical issues that will arise in the near future.

Speakers:

Speaker 1: Matthias Scheutz, Professor, Bernard M. Gordon Senior Faculty Fellow, Adjunct Professor, Psychology, Tufts School of Arts & Sciences, Director, Human-Robot Interaction Lab

Title: The Need for Explicit Ethical Mechanisms in Architectures for Autonomous Systems.

Abstract:

I will argue that ethical principles need to be deeply integrated into the operation of autonomous systems to ensure that ethical rules and laws will be followed properly and for the system to be able to explain why it decided to do what it did with recourse to the principles involved in the decision, ideally with provable guarantees. I will argue against approaches like inverse reinforcement learning or other current deep-neural network-based machine-learning approaches for autonomous systems that are not introspectable with respect to what they learned and how they internalized ethical principles, in particular, because it is then unclear of how they arrive at their decisions and what principles they use, aside from lacking provable formal guarantees.

Bio:

Matthias Scheutz received a PhD degree in philosophy from the University of Vienna and a joint Ph.D. in cognitive science and computer science from Indiana University. He is currently a full professor of computer and cognitive science in the Department of

Computer Science at Tufts University, Senior Gordon Faculty Fellow in the School of Engineering, and Director of the Human-Robot Interaction Laboratory and the Human-Robot Masters and PhD programs. He has over 400 peer-reviewed publications in artificial intelligence, artificial life, agent-based computing, natural language understanding, cognitive modeling, robotics, human-robot interaction and foundations of cognitive science. His current research focuses on complex ethical cognitive robots with natural language interaction, problem-solving, and instruction-based learning capabilities.

Speaker 2: Olivia Gambelin, AI Ethicist and founder of Ethical Intelligence

Speaker 3: Cortnie Abercrombie, CEO, Founder AI Truth. Independent Consultant. AI Strategy for Trusted AI

How AI/ML gets done in Companies and how that contributes to AI that can be untrustworthy - this presentation presents the different roles involved in developing internal and external AI capabilities and how the roles, cultures, and norms (such as use of Agile, Move fast and break things, minimal viable product mentality) of the team influence the ethics of the team and causes bad practices.

Bio:

Cortnie Abercrombie is a top advisor to Fortune 500 companies on responsible artificial intelligence and data innovation strategy, operating models and practices. She is also CEO and founder of AI Truth, a non-profit organization dedicated to responsible creation and use of AI. Prior to that she led a Shark Tank style AI solutions incubator at IBM. She was announced as one of “12 Brilliant Women in Artificial Intelligence & Ethics to Watch”, a “Top 100 Innovator in Data and Analytics” one of “10 Big Data Experts to Know”.

Speaker 4: Christoph J Ebell, Co-Founder & CEO at Arcades Digital

– **The 1st Workshop on Energy Efficiency and Artificial Intelligence (EEAI 2021)**

ORGANIZED by **(ITI) Information Technology Institute**
(CERTH-Center for Research and Technology, Greece)



The workshop has been organized by the **Information Technologies Institute, Centre for Research and Technology Hellas- CERTH.**

Sustainable energy is hands down one of the biggest challenges of our times. As the EU sets its focus to reach its 2030 and 2050 goals, the role of private energy consumers

becomes prevalent. The EU and member states are increasingly highlighting the need to complement supply-related measures (e.g. smart/efficient buildings, appliances and meters) with consumption-affecting initiatives (e.g. consumer empowerment, information and education, energy taxes and incentives).

Moreover, rather than only reducing energy consumption, novel approaches are needed that consider solutions for optimal management of local consumption and production due to an increasing number of so-called “prosumers” (consumers who also produce parts of their own energy, e.g. through photo-voltaic installations). This also calls for novel approaches to energy management in communities of prosumers that combine intelligent technologies with community-based incentives and services for a sharing economy.

The EEAI Workshop aims to bring together interdisciplinary approaches that focus on the application of AI-driven solutions for increasing and improving energy efficiency of residential and tertiary buildings and of occupant behaviour. Either applied directly on the building management systems, or aiming towards affecting energy-related occupant behavior to stimulate behavioural change, proposed solutions should enable more energy efficient and sustainable operation of buildings and stimulate energy-efficient consumer behaviour. Of particular interest are human-centered AI approaches that increase trustworthiness with explainable AI models and their results for non-expert users. The workshop also welcomes cross-domain approaches that investigate how to support energy efficiency by addressing both direct and indirect energy-related behaviour.

Program chairs of the EEAI Workshop

- **Dimitrios Tzovaras**, Information Technologies Institute, Centre for Research and Technology Hellas



- **Stelios Krinidis**, Information Technologies Institute, Centre for Research and Technology Hellas
- **Jasminko Novak**, IACS – Institute for Applied Computer Science, University of Applied Sciences Stralsund

Topics of interest of the EEAI workshop include:

- Activity Tracking
- Recommendation systems
- Human-centered and Explainable AI
- Energy (load, generation) forecasting
- Persuasion Techniques
- Energy related occupant behaviour modelling

- User modeling
- Behavior prediction and analysis in humanistic context
- Behavioural change for energy efficiency
- Energy management and services for prosumer communities
- Data visualization and visual analytics techniques
- Gamification
- Non-intrusive Load Monitoring & Disaggregation
- Flexibility estimation
- Building Automation
- Control Optimization

22nd EANN 2021 TUTORIALS
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TUTORIALS

Tutorial 1

Prof. Vangelis Metsis



Texas State University, USA

Title: Modern methods and tools for human biosignal analysis

Abstract:

The term biosignal refers to any signal that can be measured from living organisms. Biosignals have been used in medicine, sports science, and psychology for diagnoses, and there have been impressive advancements in these areas. Recently, the fields of human-computer interaction and affective computing have found an interest in using biosignals as a means of understanding the human state and intention. This interest has been reinforced by the fact that acquiring information with sensors and interfacing electrically with the human body has become much easier in the past few years. Moving from large analog technologies to digital ones has led to the miniaturization of sensing devices. Wireless transmission technologies (e.g., Bluetooth low energy), which can be easily integrated with the acquisition hardware, have removed the need for bulky wiring. This tutorial will present an overview of modern applications of human biosignals and will provide practical examples of machine learning-based methods and tools for biosignal analysis. Traditional machine learning algorithms for feature extraction and classification will be compared with recent developments in deep learning and its applications to biosignal and time-series data processing in general.

Short Bio:

Dr. Vangelis Metsis. is an Assistant Professor at the Department of Computer Science at Texas State University. He joined the department in August 2014. Dr. Metsis received his Bachelor of Science degree in Computer Science in 2005, from the Department of Informatics of Athens University of Economics and Business in Greece, and his Doctoral degree in 2011 from the Department of Computer Science and Engineering of The University of Texas at Arlington. During 2006-2007, Dr. Metsis worked as a Research Associate at the Department of Informatics and Telecommunications of the National Center for Scientific Research (NCSR) “Demokritos” in Greece, contributing to the project MedIEQ, funded by the European Commission. After receiving his Ph.D. diploma, and until joining TxState, he was employed, as a Research Assistant Professor by UTA, and he continued to be affiliated with Heracleia Human-Centered Computing Laboratory, where he was involved in several federally-funded research projects, as a Co-PI or Senior Researcher. He also taught a number of graduate and undergraduate classes at the CSE department. Dr. Metsis research interests span the areas of Machine Learning, Data Mining and Computer Vision with focus in applications of Smart Health and Wellbeing, Assisted Living and Bioinformatics.

Tutorial 2**Prof. Giacomo Boracchi**Politecnico di Milano, Italy

Title: Anomaly Detection in Images

Anomaly detection problems are ubiquitous in engineering: the prompt detection of anomalies is often a primary concern, since these might provide precious information for understanding the dynamics of a monitored process and for activating suitable countermeasures. In fact, anomalies are typically the most informative regions in an image (e.g., defects in images used for quality control). Not surprisingly, anomaly detection problems have been widely investigated in the image processing and pattern recognition communities and are key in application scenarios ranging from quality inspection to health monitoring. The tutorial presents a rigorous formulation of the anomaly-detection problem that fits with many imaging scenarios and applications. The tutorial describes, by means of illustrative examples, the most important anomaly-detection approaches in the literature, and their connection with the machine-learning perspective of semi-supervised and unsupervised learning/monitoring. Special emphasis will be given to anomaly-detection methods based on learned models, which are often adopted to handle images and signals. In particular, these will be divided into traditional models (including dictionaries yielding sparse representations) and deep learning

models. The tutorial is accompanied by various examples from our research projects where we applied anomaly-detection algorithms to solve real world problems: visual quality inspection for monitoring chip and nanofiber production.

Short Bio:

Giacomo Boracchi is an Associate Professor of Computer Engineering at Dipartimento di Elettronica, Informazione e Bioingegneria of the Politecnico di Milano, where he also received the Ph.D. in information technology (2008), after graduating in Mathematics (Università Statale di Milano, 2004). His research interests concern image processing and machine learning, and in particular image restoration and analysis, change/anomaly detection, domain adaptation. Since 2015 he is leading industrial research projects concerning algorithms for X-ray inspection systems for airport security, automatic quality inspection systems for monitoring silicon wafer production (the system developed with STMicroelectronics is currently analyzing wafer production over different sites), and outlier detection in web-sessions. He is currently associate editor for IEEE Transactions on Image Processing and server as AE for IEEE Computational Intelligence Magazine and in a few special issues. In 2015 he received an IBM Faculty Award, in 2016 the IEEE Transactions on Neural Networks and Learning Systems Outstanding Paper Award and in 2017 the Nokia Visiting Professor Scholarship. He has held tutorials in major IEEE conferences: ICIP 2020, ICASSP 2018 and IJCNN 2017, 2018.

THEMATIC AREAS OF ACCEPTED PAPERS of the 22nd EANN 2021

The accepted papers of the 22nd EANN conference are related to the following thematic topics:

- Adversarial Neural Networks
- Anomaly Detection
- Augmented explainable Machine Learning
- Activity Recognition
- Biomedical Machine Learning systems
- Blockchain Adaptive Systems
- Convolutional Neural Networks
- Classifiers
- Cybersecurity
- Deep Learning
- Emotion Recognition
- Ensembles
- Facial Recognition
- Fuzzy Neuro Fuzzy systems
- Hybrid Machine Learning systems
- Image Processing using Deep Learning
- Natural Language
- Recommendation systems
- Recurrent Neural Networks
- Smart Energy Grids

22nd EANN 2021 INTERNATIONAL PARTICIPATION

The authors of submitted papers came from 16 different countries from all over the globe, namely: Brazil, Chile, Finland, France, Greece, Germany, Ireland, Israel, Italy, Japan, Netherlands, Poland, Spain, Sweden, UK, USA.

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- **Gerasimos Vonitsanos** University of Patras, Greece

Detailed Program of the joint 22nd EANN 2021 - 17th AIAI 2021 Conference

Friday 25/6/2021

10:00–18:00 Registration

10:30-10:45 Welcome Session

10:45-11:45

Session 1, Plenary 1: “Brain-Inspired Data Analytics for Incremental and Transfer Learning of Cognitive Spatio-Temporal Data and for Knowledge Transfer”

Chair: Prof. Lazaros Iliadis

Keynote Speaker: Nikola Kasabov

Fellow IEEE, Fellow RSNZ, Fellow INNS College of Fellows, Professor of Knowledge Engineering and Founding Director KEDRI Auckland University of Technology, Auckland, New Zealand George Moore Chair/Professor, University of Ulster, UK, Honorary Professor Teesside University UK and the University of Auckland, NZ

11:45-13:00

Session 2, EANN: DL-CON I (DEEP LEARNING - CONVOLUTIONAL I)

Chair: Prof. George Magoulas

fNIRS-Based BCI Using Deep Neural Network with an Application to Deduce the Driving Mode based on the Driver's Mental State

Kazuhiko Takahashi, Reo Yokono, Chang Chu, Gauvain Huve, Masafumi Hashimoto

Deep Learning Modeling of Groundwater Pollution Sources

Yiannis N. Kontos, Theodosios Kassandra, Konstantinos Katsifarakis, Kostas Karatzas

Image Pre-processing and Segmentation for Real-Time Subsea Corrosion Inspection

Craig Pirie, Carlos Moreno-Garcia

Exploring the Limits of Vanilla CNN Architectures for Fine-grained Vision-based Vehicle Classification

Andreas Caduff, Klaus Zahn, J. Hofstetter, M. Rechsteiner, P. Bucher

An Artificial Intelligence System for Endotracheal Intubation Confirmation

Dror Lederman

11:45-13:00

Session 3, AIAI: DL-CON II (DEEP LEARNING - CONVOLUTIONAL II)

Chair: Prof. Elias Pimenidis

A Comparative Study of Deep Learning Techniques for Financial Indices Prediction

Argyrios Ketsetsis, Konstantinos Giannoutakis, Georgios Spanos, Nikolaos Samaras, Dimitrios Hristu-Varsakelis, Dimitrios Thomas, Dimitrios Tzovaras

Robustness testing of AI systems: A case study for traffic sign recognition

Christian Berghoff, Pavol Bielik, Matthias Neu, Petar Tsankov, Arndt von Twickel

Deep Dense and Convolutional Autoencoders for Machine Acoustic Anomaly Detection

Gabriel Coelho, Pedro Pereira, Luis Matos, Alexandrine Ribeiro, Eduardo Nunes, André Ferreira, Paulo Cortez, Andre Pilastrri

Just-in-time Biomass Yield Estimation with Multi-Modal Data and Variable Patch Training Size

Patricia O'Byrne, Patrick Jackman, Damon Berry, Thomas Lee, Michael French, Robert J. Ross

Automatic Classification of XCT Images in Manufacturing

Bertram Sabrowsky-Hirsch, Roxana-Maria Holom, Christian Gusenbauer, Michael Reiter, Florian Reiterer, Ricardo Fernández Gutiérrez, Josef Scharingesr

11:45-13:00

Session 4, Workshop: DARE (Distributed AI for Resource-Constrained Platforms)

Chair: Dr. Anna Hristoskova & Dr. Nicolás González-Deleito

Distributed data compression for edge devices.

Kevin Van Vaerenbergh, Tom Tourwe

PFilter: Privacy-aware and secure data filtering at the edge for distributed edge analytics

Annanda Rath, Anna Hristoskova, Sarah Klein

An Initial Analysis of the Shortcomings of Conventional AI and the Benefits of Distributed AI

Approaches in Industrial Use Cases

Anna Hristoskova, Nicolás González-Deleito, Sarah Klein, Joana Sousa, Nuno Martins, João Tagaio, João Serra, Carlos Silva, João Ferreira, Pedro M. Santos, Ricardo Morla, Luis Almeida, Barış Bulut, Sencer Sultanoğlu

Towards a Distributed Learning Architecture for Securing ISP Home Customers

Pedro Santos, Joana C Sousa, Ricardo Morla, Nuno Martins, João Tagaio, João Serra, Carlos Silva, Mário Sousa, Pedro Souto, Luís Lino Ferreira, João Ferreira, Luis Almeida

A first sensitivity study of multi-object multi-camera tracking performance

Miguel Ramos, Carlos Pereira, Luis Almeida

11:45-13:45

Session 5, Workshop: nIoVe (Designing a Novel Adaptive Cybersecurity Solution for Internet-of-Vehicle) / **Discussion Forum / Open Session**

Chair: Dr. Konstantinos Votis

11:45-12:00 - Presentation of the nIoVe project

12:00-12:20 - Aspects of stakeholders' requirements

12:30-13:45 - Round table discussion with stakeholders' representatives, researchers from projects in the same domain, and external experts in the field of cybersecurity, automotive industry, and AI

11:45-13:45

Session 6, Workshop: DAAI (Defense Applications of AI) / **Discussion Forum / Open**

Session

Co-Organized together with European Defense Agency

Chair: Dr. Panagiotis Kikiras

11:45-12:00 - Dr. Panagiotis Kikiras, European Defence Agency

Introduction & Welcome message by the Organizers

12:00-12:45 - Dr. Evangelos Ouzounis, European Defence Agency

Artificial Intelligence Cybersecurity Challenges - How Cyber Security and Privacy Affects the Smooth Deployment of AI – ENISA's Approach

13:00-13:45 - Sergio Albani, European Union Satellite Centre

Application of AI for GEOINT services in the Space and Security domain

13:15-14:30

Session 7, Workshop: AIETH 2021 The 1st Workshop on AI and Ethics

Chair: Prof. John Macintyre

Pro Vice Chancellor at the University of Sunderland, United Kingdom

13:15-13:30 - Professor Matthias Scheutz, Bernard M. Gordon Senior Faculty Fellow, Adjunct Professor, Psychology, Tufts School of Arts & Sciences, Director, Human-Robot Interaction Lab

13:30-13:45 - Olivia Gambelin, AI Ethicist and founder of Ethical Intelligence

13:45-14:00 - Cortnie Abercrombie, CEO, Founder AI Truth. Independent Consultant. AI Strategy for Trusted AI

14:00-14:15 - Christoph J Ebell, Co-Founder & CEO at Arcades DigitalFree discussion-exchange of Arguments with conference participants during the event)

13:15-14:30

Session 8, AIAI: REC_SENT_IMP (Recommendation Systems-Sentiment Analysis-AI Impacts)

Chair: Prof. Peter Hajek

Recommending Database Architectures for Social Queries: A Twitter Case Study

Michael Marountas, Georgios Drakopoulos, Phivos Mylonas, Spyros Sioutas

The AI4Media project: Use of Next-generation Artificial Intelligence Technologies for Media Sector Applications

Filareti Tsalakanidou, Symeon Papadopoulos, Vasileios Mezaris, Ioannis Kompatsiaris, Birgit Gray, Danae Tsabouraki, Maritini Kalogerini, Fulvio Negro, Maurizio Montagnuolo, Jesse de Vos, Philo van Kemenade, Daniele Gravina, Rémi Mignot, Alexey Ozerov, Francois Schnitzler, Artur Garcia-Saez, Georgios N. Yannakakis, Antonios Liapis, Georgi Kostadinov

Science4Fashion: An Autonomous Recommendation System for Fashion Designers

Iordanis Koutsopoulos, Maria Halkidi

A two-step optimised BERT-based NLP algorithm for extracting sentiment from financial news

Rapheal Olaniyan, Daniel Stamate, Ida Pu

13:15-14:30

Session 9, Workshop: DARE (Distributed AI for Resource-Constrained Platforms) /
Discussion Forum / Open Session

Chair: Dr. Anna Hristoskova & Dr. Barış Bulut

13:15-13:20 - Introduction & Welcome message by the Organizers

13:20-13:35 - Emiliano Casalicchio, BTH – BLEKINGE TEKNISKA HÖGSKOLA, Sweden
An Energy-aware Multi-Criteria Federated Learning Model for Edge Computing

13:40-13:55 - Müjdat Soytürk, Marmara University, Turkey

Edge Computing and V2X: the new ecosystem on the Cloud and the network architecture

14:00-14:15 - Thomas De Moor, Sentigrate, Belgium

Intelligence trade-off: edge vs cloud

14:15-14:30 - Emre Kaplan, AVL, Turkey

Personalized Gear Shifting Architecture for Next Generation Automatic Transmission

15:30-16:30

Session 11, EANN: BIOMED (BIOMEDICAL)

Chair: Prof. Ilias Maglogiannis

Deep Learning of Brain Asymmetry Images and Transfer Learning for Early Diagnosis of Dementia

Nitsa Herzog, George Magoulas

Liver cancer trait detection and classification through Machine Learning on smart mobile devices

Olympia Giannou, Anastasios Giannou, Dimitra Zazara, Dörte Kleinschmidt, Tobias Mummert, Björn Ole Stüben, Michael Gerhard Kaul, Gerhard Adam, Samuel Huber, Georgios Pavlidis

Deep learning topology-preserving EEG-based images for autism detection in infants

Cosmin Stamate, George Magoulas, Michael Thomas

Using WOA with Feed Forward Neural Network in Prediction of Subcutaneous Glucose Concentration for Type-I Diabetic Patients

Fayrouz Allam

15:30-16:45

Session 12, AIAI: AUTOML-AUTOAG (AUTONOMOUS MACHINE LEARNING-AUTONOMOUS AGENTS)

Chair: Dr. Georgios Drakopoulos

Object Migration Automata for Non-Equal Partitioning Problems with Known Partition Sizes

Rebekka Olsson Omslandseter, Lei Jiao, John Oommen

An Automated Machine Learning Approach for Predicting Chemical Laboratory Material Consumption

António João Silva, Paulo Cortez

An Ontology-Based Concept for Meta AutoML

Bernhard Humm, Alexander Zender

Enhanced Security Framework for Enabling Facial Recognition in Autonomous Shuttles Public Transportation during COVID-19

Dimitrios Tsiktsiris, Antonios Lalas, Minas Dasygenis, Konstantinos Votis, Dimitrios Tzouvaras

Evaluating Task-General Resilience Mechanisms in a Multi-Robot Team Task

James Staley, Matthias Scheutz

15:30-16:45

Session 13, Workshop: 5G-PINE I (5G – Putting Intelligence to the Network Edge I)

INDUSTRY/AI 5G TECHNOLOGY Organization by the Hellenic Telecommunications

Organization Research Group

Chair: Dr. Ioannis Chochliouros

V2X Communications for the Support of GLOSA and Intelligent Intersection Applications

Ioannis Chochliouros, Anastasia Spiliopoulou, Pavlos Lazaridis, Zaharias Zaharis, Michail-Alexandros Kourtis, Slawomir Kuklinski, Lechoslaw Tomaszewski, Dimitrios Arvanitosis, Alexandros Kostopoulos

Machine Learning-Based, Networking and Computing Infrastructure Resource Management

Alexandros Kostopoulos, Ioannis Chochliouros, Miquel Payaro, Christos Verikoukis, Sabrina De Capitani di Vimercati

5G Communications as “Enabler” for Smart Power Grids: The Case of the Smart5Grid Project

Daniele Porcu, Ioannis P. Chochliouros, Sonia Castro, Giampaolo Fiorentino, Rui Costa, Dimitrios Nodaras, Vaios Koumaras, Fabrizio Brasca, Nicola di Pietro, George Papaioannou, Irina Ciornei, Antonios Sarigiannidis, Nikolay Palov, Teodor Bobochikov, Charilaos Zarakovitis, Anastasia S. Spiliopoulou

5G-VICTORI: Future Railway Communications Requirements Driving 5G Deployments in Railways

Ioanna Mesogiti, Eleni Theodoropoulou, Fotini Setaki, George Lyberopoulos, Anna Tzanakaki, Markos Anastassopoulos, Christina Politi, Panagiotis Papaioannou, Christos Tranoris, Spyros Denazis, Paris Flegkas, Nikos Makris, Nebojsa Maletic, Darko Cvetkovski, Jesus Gutierrez Teran, Panteleimon Konstantinos Chartsias, Konstantinos Stamatis, Maria-Evgenia Xezonaki, Dimitrios Kritharidis, Alexandros Dalkalitsis, Manfred Taferner, Martin Piovarci

TYPHON: Hybrid Data Lakes for Real-time Big Data Analytics – An Evaluation Framework in the Telecom Industry

Antonis Misargopoulos, George Papavassiliou, Christos Antonios Gizelis, Filippos Nikolopoulos-Gkamatsis

15:30-17:45

Session 6, Workshop: DAAI (Defense Applications of AI) / **Discussion Forum / Open Session**

Co-Organized together with European Defense Agency

Chair: Dr. Panagiotis Kikiras

Project presentation session, EDA invited projects

- ABIDE and CLAUDIA, EDA research on innovative techniques to support the decision-making process, Jose Luis Delgado Gamella
 - Artificial Intelligence for Energy and Environmental performance in Defence – Perspectives from EDA's ARTENET project, Prof. Christos Markopoulos
 - Artificial Intelligence for Automatic Detection Recognition, Identification and Tracking, Marcos Quintana Everis
-

16:45-17:30

Session 15, EANN: ML-REC-SENT (MACHINE LEARNING - RECOMMENDATION SYSTEMS - SENTIMENT ANALYSIS)

Chair: Assoc. Prof. Phivos Mylonas

Real-time Multimodal Emotion Classification System in E-learning Context

Arijit Nandi, Fatos Xhafa, Laia Subirats, Santi Fort

A Multi-Modal Audience Analysis System for Predicting Popularity of Online Videos

Alexandros Vrochidis, Nikolaos Dimitriou, Stelios Krinidis, Savvas Panagiotidis, Stathis Parcharidis, Dimitrios Tzovaras

Do Weibo platform experts perform better on predicting stock market?

Ziyuan Ma, Conor Ryan, Jim Buckley, Muslim Chochlov

16:45-17:45

Session 16, Workshop: 5G-PINE II (5G – Putting Intelligence to the Network Edge II) **INDUSTRY/AI 5G TECHNOLOGY** Organization by the Hellenic Telecommunications

Organization Research Group

Chair: Dr. Ioannis Chochliouros

Top Challenges in 5G Densification

Eleni Theodoropoulou, Ioanna Mesogiti, Foteini Setaki, Konstantinos Filis, George Lyberopoulos, Agapi Mesodiakaki, Marios Gatzianas, Christos Vagionas, George Kalfas, Mauro Agus, Annachiara Pagano

Advanced first responders' services by using FASTER project Architectural Solution

Christina Lessi, Ioannis Chochliouros, Panagiotis Trakadas, Panagiotis Karkazis

5G-VICTORI: Optimizing Media Streaming in Mobile Environments using mmWave, NBMP and 5G Edge Computing

Louay Bassbouss, Mehdi Ben Fadhel, Anita Chen, Stefan Pham, Stephan Steglich, Eric Troudt, Marc Emmelmann, Jesús Gutiérrez, Nebojsa Maletic, Eckhard Grass, Stefan Schinkel, Annette Wilson, Sven Glaser, Christian Schlehuber

High mobility 5G services for vertical industries - network operator's view

Lechostaw Tomaszewski, Ioannis Chochliouros, Robert Kofakowski, Sławomir Kukliński, Michail-Alexandros Kourtis

16:45-17:45

Session 17, Workshop: AI-BIO (Artificial Intelligence in Biomedical Engineering and Informatics)

Chair: Prof. Ilias Maglogiannis

A Machine Learning Approach for Recognition of Elders' Activities using Passive Sensors

Anastasios Panagiotis Psathas, Antonios Papaleonidas, Lazaros Iliadis

An inception-based architecture for haemodialysis time series classification

Giorgio Leonardi, Stefania Montani, Manuel Striani

Analyzing Collective Knowledge towards Public Health Policy Making

Spyridon Kleftakis, Konstantinos Mavrogiorgos, Nikolaos Zafeiropoulos, Argyro Mavrogiorgou, Athanasios Kiourtis, Ilias Maglogiannis, Dimosthenis Kyriazis

Evaluating mental patients utilizing video analysis of facial expressions

M Tziomaka, Athanasios Kallipolitis, P Tsanakas, Ilias Maglogiannis

17:45-18:45

Session 18, Plenary 2: "Backpropagation Free Deep Learning"

Chair: Prof. Plamen Angelov

Keynote Speaker: Jose Principe

Professor of Electrical and Computer Engineering and Biomedical Engineering, University of Florida. Eckis Endowed Professor and Founder-Director of the University of Florida Computational NeuroEngineering Laboratory.

Saturday 26/6/2021

10:00-17:30 Registration

10:30-11:45

Session 19, EANN: DEE-BLKCH-SEG (DEEP LEARNING-BLOCKCHAIN-SMART ENERGY GRIDS)

Chair: Dr. Konstantinos Demertzis

A Hybrid Deep Learning Ensemble for Cyber Intrusion Detection

Anastasios Panagiotis Psathas, Lazaros Iliadis, Antonios Papaleonidas

Addressing Computer Vision Challenges using an Active Learning Framework

Christina Tzogka, Ioannis Refanidis

Search Problems in Contemporary Power Grids

Theofanis Aravanis, Andreas Petratos, Georgia Douklia, Efpraxia Plati

Incentivizing Participation to Distributed Neural Network Training

Spyridon Nikolaidis, Ioannis Refanidis

Blockchained Adaptive Federated Auto MetaLearning BigData and DevOps CyberSecurity Architecture in Industry 4.0

Konstantinos Demertzis, Lazaros Iliadis, Elias Pimenidis, Nikolaos Tziritas, Maria Koziri, Panagiotis Kikiras

10:30-11:45

Session 20, AIAI: ML-HYB (MACHINE LEARNING/ HYBRID SYSTEMS)

Chair: Assoc. Prof. Christos Tjortjis

Using Machine Learning Methods to Predict Subscriber Churn of a Web-based Drug Information Platform

Athanasios Tsadiras, Georgios Theodoridis

Predicting CO2 Emissions for Buildings Using Regression and Classification

Alexia Avramidou, Christos Tjortjis

Intelligent Techniques and Hybrid Systems Experiments Using the Acumen Modeling and Simulation Environment

Sotirios Tzamaras, Stavros Adam, Walid Taha

Classification of Point Clouds with Neural Networks and Continuum-Type Memories

Stefan Reitmann, Elena Kudryashova, Bernhard Jung, Volker Reitmann

An automated tool to support an intelligence learner management system using Learning Analytics and Machine Learning

Shareeful Islam, Hasan Mahmud, Haralambos Mouratidis

10:30-11:45

Session 21, AIAI: AD-DTM (ADAPTIVE-DATA MINING)

Chair: Dr. Ioannis Livieris

Dynamic Plume Tracking Utilizing Symbiotic Heterogeneous Remote Sensing Platforms

Iakovos Michailidis, Athanasios Kapoutsis, Elias Kosmatopoulos, Yannis Boutalis

Self-organizing maps for optimized robotic trajectory planning applied to surface coating

Maria Tzinava, Konstantinos Delibasis, Spyros Kamnis

Regression Predictive Model to analyze Big Data Analytics in Supply Chain Management

Elena Puica

If Only I Would Have Done That...': A Controlled Adaptive Network Model for Learning by Counterfactual Thinking

Raj Bhalwankar, Jan Treur

A Multi-View Clustering Approach for Analysis of Streaming Data

Vishnu Manasa Devagiri, Veselka Boeva, Shahrooz Abghari

10:30-11:15

Session 22, Workshop: DAAI (Defense Applications of AI) / **Discussion Forum / Open Session**

Co-Organized together with European Defense Agency

Chair: Dr. Giorgos Dimitriou

EDA Action plan presentation

Panagiotis Kikiras, European Defence Agency

11:15-12:00

Session 23, Workshop: DAAI (Defense Applications of AI) / **Discussion Forum / Open Session**

Co-Organized together with European Defense Agency

Chair: Dr. Giorgos Dimitriou

Research on AI-based capabilities for the European Border and Coast Guard

Darek Saunders, Head of the Border Security Observatory - FRONTEX

12:00-13:30

Session 24, TUTORIAL 2 - ANDIM

"Anomaly Detection in Images"

Chair: Prof. Ilias Maglogiannis

Tutor: **Prof. Giacomo Boracchi**

Politecnico di Milano, Italy

12:00-13:00

Session 25, EANN: DEE_CON (DEEP-CONVOLUTIONAL)

Chair: Prof. Ioannis Refanidis

Repeatable functionalities in complex layers of formal neurons

Leon Bobrowski, Tomasz Łukaszuk

Data Fusion for Deep Learning on Transport Mode Detection: A Case Study

Hugues Moreau, Andrea Vassilev, Liming Chen

Toward an augmented and explainable machine learning approach for classification of defective nanomaterial patches

Cosimo Ieracitano, Nadia Mammone, Annunziata Paviglianiti, Francesco Carlo

Morabito

Using Artificial Neural Network to Provide Realistic Lifting Capacity in the Mobile Crane Simulation

Simon Roysson, Taufik Akbar Sitompul, Rikard Lindell

12:00-13:15

Session 26, AIAI: NAT_LA (NATURAL LANGUAGE)

Chair: Prof. Elias Pimenidis

A comparative assessment of state-of-the-art methods for multilingual unsupervised keyphrase extraction

Nikolaos Giarelis, Nikos Kanakaris, Nikos Karacapilidis

Machine Learning Meets Natural Language Processing - The story so far

Nikolaos-Ioannis Galanis, Panagiotis Vafiadis, Kostas-Gkouram Mirzaev, George Papakostas

Robust Pose Estimation Based on Maximum Correntropy Criterion

Qian Zhang, Badong Chen

CEA-TM: A Customer Experience Analysis framework based on Contextual-aware Topic Modeling approach

Ariona Shashaj, Davide Stirparo, Mohammad Kazemi

SemAI: A Novel Approach for Achieving Enhanced Semantic Interoperability in Public Policies

George Manias, Athanasios Kiourtis, Argyro Mavrogiorgou, Dimosthenis Kyriazis

12:00-13:15

Session 27, AIAI: ML-IoT (MACHINE LEARNING - INTERNET OF THINGS)

Chair: Asst. Prof. Athanasios Tsadiras

Verification of Size Invariance in DNN Activations using Concept Embeddings

Gesina Schwalbe

A Comparative Study of Embedded Feature Selection Methods on Microarray data

Hind Hamla, Khadoudja Ghanem

BEMS in the Era of Internet of Energy: A Review

Asimina Dimara, Christos-Nikolaos Anagnostopoulos, Konstantinos Kotis, Stelios Krinidis, Dimitrios Tzovaras

Cyber Supply Chain Threat Analysis and Prediction using Machine Learning and Ontology

Shareeful Islam, Abel Yeboah-Ofori, Umar Ismail, Haralambos Mouratidis, Spyridon Papastergiou

"SAVE" – an Integrated Approach of Personal and Home Safety for Active Assisted Living

Sorin-Aurel Moraru, Adrian Alexandru Mosoi, Dominic Mircea Kristaly, Florin Sandu, Dan Floroian, Delia Elisabeta Ungureanu, Liviu Marian Perniu

12:00-13:15

Session 28, Workshop: MHDW_I (Mining Humanistic Data Workshop I)

Chair: Assoc. Prof. Katia Lida Kermanidis

Movie Recommendation System based on Character Graph Embeddings

Agisilaos Kounelis, Pantelis Vikatos, Christos Makris

Privacy-Preserving Text Labelling Through Crowdsourcing

Giannis Haralabopoulos, Mercedes Torres Torres, Ioannis Anagnostopoulos, Derek Mcauley

Forecasting Air Flight Delays and Enabling Smart Airport Services in Apache Spark

Gerasimos Vonitsanos, Theodor Panagiotakopoulos, Andreas Kanavos, Athanasios Tsakalidis

Visitor behavior analysis for an ancient Greek technology exhibition

Dimitrios Kosmopoulos, Kali Tzortzi

Recognition of epidemic cases in social web texts

Apostolos Antonakakis, Eleftherios Alexiou, Nemanja Jevtic, Georgios Sideras, Eftichia Farmaki, Sofronia Foutsitzi, Katia Lida Kermanidis

12:00-13:30

Session 29, Workshop: DARE (Distributed AI for Resource-Constrained Platforms) /
Discussion Forum / Open Session

Chair: Dr. Giorgos Dimitriou

AI in Security and Defence, Moderated Round table

13:30-14:30

Session 30, Plenary 3: “Is “Big Tech” Becoming the “Big Tobacco” of Artificial Intelligence?”

Chair: Prof. Lazaros Iliadis

Keynote Speaker: John Macintyre

Pro Vice Chancellor at the University of Sunderland, United Kingdom

15:30-16:30

Session 31, Plenary 4: “Human-Centered Computer Vision: Core Components and Applications”

Chair: Prof. Ilias Maglogiannis

Keynote Speaker: Antonis Argyros

Professor and Chair, Computer Science Department, University of Crete, Greece
Researcher, Foundation for Research and Technology – Hellas (FORTH)

16:30-17:45

Session 32, EANN: DEE-CLA-FZ (DEEP LEARNING-CLASSIFICATION-FUZZY)

Chair: Assoc. Prof. Dimitrios Kosmopoulos

EANN # 41, 38, 14, 19, 17

Face Detection with YOLO on Edge

Adamu Ali-Gombe, Eyad Elyan, Carlos Francisco Moreno-García, Johan Zwiigelaar

Fuzzy Approach to Identity Resolution

Asif Nawaz, Hassan Kazemian

Anomaly Detection by Robust Feature Reconstruction

Ron Triepels Theofanis Aravanis, Andreas Petratos, Georgia Douklia, Efpraxia Plati
Squeeze-and-Threshold based quantization for Low-Precision Neural Networks

Binyi Wu, Bernd Waschneck, Christian Mayr

Efficient Realistic Data Generation Framework leveraging Deep Learning-based Human Digitization

Charalampos Symeonidis, Paraskevi Nousi, Pavlos Tosidis, Konstantinos Tsampazis, Nikolaos Passalis, Anastasios Tefas, Nikos Nikolaidis

16:30-17:45

Session 33, AIAI: DL-BLC (DEEP LEARNING - BLOCKCHAIN)

Chair: Assoc. Prof. Vangelis Metsis

Improved Biomedical Entity Recognition via longer context modelling

Nikolaos Stylianou, Panagiotis Kosmoliaptsis, Ioannis Vlahavas

ebioMelDB: Multi-modal database for melanoma and its application on estimating patient prognosis

Aigli Korfiati, Giorgos Livanos, Christos Konstantinou, Sophia Georgiou, George Sakellaropoulos

Federated Blockchain Supply Chain Management: A CyberSecurity and Privacy Framework

Konstantinos Demertzis, Lazaros Iliadis, Elias Pimenidis, Nikolaos Tziritas, Maria Koziri, Panagiotis Kikiras, Michael Tonkin

Learning Sentiment-aware Trading Strategies for Bitcoin leveraging Deep Learning-based Financial News Analysis

Nikolaos Passalis, Solon Seficha, Avraam Tsantekidis, Anastasios Tefas

Analysis and Prediction for House Sales Price Using a Hybrid Machine Learning Approach

S. M. Soliman Hossain, Jyoti Rawat, Doina Logofatu

16:30-17:45

Session 34, Workshop: EEAI (Energy Efficiency and Artificial Intelligence)

Chair: Dr. Stelios Krinidis, Dr. Dimitrios Tzovaras, Prof. Jasminko Novak

Semantic modeling of trustworthy IoT entities in energy-efficient cultural spaces

Konstantina Zachila, Konstantinos Kotis, Asimina Dimara, Stamatia Ladikou, Christos-Nikolaos Anagnostopoulos

Short Term Net Imbalance Volume Forecasting through Machine and Deep Learning: A UK case study

Elpiniki Makri, John Koskinas, Apostolos Tsolakis, Dimosthenis Ioannidis, Dimitrios Tzovaras

Explainable needn't be (much) less accurate: evaluating an explainable AI dashboard for energy forecasting

Ana Grimaldo, Jasminko Novak

Improving Energy Efficiency in Tertiary Buildings through user-driven Recommendations delivered on optimal Micro-moments

Apostolos C. Tsolakis, George Tsakirakis, Vasileios G. Vasilopoulos, Konstantinos Peppas, Charisios Zafeiris, Iordanis Makaratzis, Ana Grimaldo, Stelios Krinidis, Jasminko Novak, George Bravos, Dimitrios Tzovaras

A Recommendation Specific Human Activity Recognition Dataset with Mobile Device's Sensor Data

Alexandros Vrochidis, Vasileios G. Vasilopoulos, Konstantinos Peppas, Valia Dimaridou, Iordanis Makaratzis, Apostolos C. Tsolakis, Stelios Krinidis, Dimitrios Tzovaras

16:30-17:30

Session 35, Workshop: DAAI (Defense Applications of AI)

Chair: Prof. Lazaros Iliadis

On the potential of SDN enabled network deployment in tactical environments

Georgios Lazaridis, Kostas Papachristou, Anastasios Drosou, Dimosthenis Ioannidis, Periklis Chatzimisios, Dimitrios Tzovaras

A Lipschitz - Shapley Explainable Defense Methodology Against Adversarial Attacks

Konstantinos Demertzis, Panagiotis Kikiras, Lazaros Iliadis

A Multimodal AI-leveraged Counter-UAV Framework for Diverse Environments

Eleni Diamantidou, Antonios Lalas, Konstantinos Votis, Dimitrios Tzovaras

Cyber-attack detection and trust management toolkit for defence-related microgrids

Charalampos - Rafail Medentzidis, Thanasis Kotsiopoulos, Vasileios Vellikis, Dimosthenis Ioannidis, Dimitrios Tzovaras, Panagiotis Sarigiannidis

Sunday 27/6/2021

10:00-18:00 Registration

10:30-11:30

Session 36, Plenary 5: "How can Artificial Intelligence efficiently support Sustainable Development?"

Chair: Prof. Ilias Maglogiannis

Keynote Speaker: Eunika Mercier-Laurent

Université de Reims Champagne-Ardenne, CReSTIC/MODECO

11:30-12:45

Session 37, EANN: DEE – ADV-FUZZY (DEEP LEARNING – ADVERSARIAL-FUZZY)

Chair: Prof. Hassan Kazemian

Deep Learning for Water Quality Classification in Water Distribution Networks

Essa Q. Shakra, Wenyan Wu, Shadi Basurra, Stamatia Rizou

Face Spoof Detection: An Experimental Framework

Faseela Abdullakutty, Eyad Elyan, Pamela Johnston

Automatic Facial Expression Neutralisation Using Generative Adversarial Network

Wiem Grina, Ali Douik

Early prediction of COVID-19 onset by fuzzy-neuro inference

Mario Malcangi

Creating Ensembles of Generative Adversarial Network Discriminators for One-class Classification

Mihai Ermaliuc, Daniel Stamate, George Magoulas, Ida Pu

11:30-12:45

Session 38, AIAI: ML-BIC (MACHINE (DEEP) LEARNING-BRAIN INSPIRED COMPUTING)

Chair: Prof. Will Serrano

System-wide anomaly detection of industrial control systems via deep learning and correlation analysis

Gordon Haylett, Zahra Jadidi, Kien Nguyen Thanh

PQ-HDC: Projection-based Quantization Scheme for Flexible and Efficient Hyperdimensional Computing

Chi-Tse Huang, Cheng-Yang Chang, YUCHUAN CHUANG, An-Yeu Wu

Scalable NPairLoss-based Deep-ECG for ECG Verification

Yu-Shan Tai, Yi-Ta Chen, An-Yeu Wu

Hyperdimensional Computing with Learnable Projection for User Adaptation Framework

Yu-Ren Hsiao, YUCHUAN CHUANG, Cheng-Yang Chang, An-Yeu (Andy) Wu

An Approach Utilizing Linguistic Features for Fake News Detection

Dimitrios Panagiotis Kasseropoulos, Christos Tjortjis

11:30-12:30

Session 39, AIAI: DL-CON III (DEEP LEARNING CONVOLUTIONAL_III)

Chair: Assoc. Prof. Christos Makris

An autoencoder convolutional neural network framework for Sarcopenia detection based on multi-frame ultrasound image slices

Emmanuel Pintelas, Ioannis Livieris, Nikolaos Barotsis, George Panayiotakis, Panagiotis Pintelas

A Computational Model for the Second-Order Adaptive Causal Relationships between Anxiety, Stress and Physical Exercise

Lars Rass, Jan Treur

Improving the flexibility of production scheduling in flat steel production through standard and AI-based approaches: challenges and perspectives

Vincenzo Iannino, Valentina Colla, Alessandro Maddaloni, Jens Brandenburger, Ahmad Rajabi, Andreas Wolff, Joaquin Ordieres, Miguel Gutierrez, Erwin Sirovnik, Dirk Mueller, Christoph Schirm

Efficient Approaches for Density-Based Spatial Clustering of Applications with Noise (short)

Pretom Kumar Saha, Doina Logofatu

11:30-12:30

Session 40, Workshop: MHDW_II (Mining Humanistic Data Workshop II)

Chair: Asst. Prof. Andreas Kanavos

Self-supervised approach for Urban Tree Recognition on Aerial Images

Lakshmi Babu Saheer, Mohamed Shahawy

Community Detection Algorithms for Cultural and Natural Heritage Data in Social Networks *Andreas Kanavos, Maria Trigka, Elias Dritsas, Gerasimos Vonitsanos, Phivos Mylonas*

Active Bagging Ensemble Selection

Vangjel Kazllarof, Sotiris Kotsiantis

Applying Machine Learning to Predict Whether Learners will Start a MOOC after Initial Registration

Theodor Panagiotakopoulos, Sotiris Kotsiantis, Spiros Borotis, Fotis Lazarinis, Achilles Kameas

13:00-14:00

Session 41, Plenary 6: "Deep learning and Kernel Machines"

Chair: Prof. Eunika Mercier-Laurent

Keynote Speaker: Prof. Dr.ir. Johan Suykens

KU Leuven, ESAT-Stadius and Leuven AI Institute

14:00-15:15

Session 42, EANN: DEE-FUZZ (DEEP LEARNING-FUZZY)

Chair: Assoc. Prof. Christos Makris

Deep Neural Networks for Indoor Geomagnetic Field Fingerprinting with Regression Approach

Mahdi Abid, Grégoire Lefebvre

Drilling Operations Classification Utilizing Data Fusion and Machine Learning Techniques

Marzieh Zare, Jussi-Pekka Lehtinen, Hesam Jafarian, Ari Visa, Liisa Aha

Impact of Classifiers to Drift Detection Method: A comparison

Angelos Angelopoulos, Anastasios Giannopoulos, Nikolaos Kapsalis, Sotirios Spantideas, Lambros Sarakis, Stamatias Voliotis, Panagiotis Trakadas

Recommender systems algorithm selection using machine learning

Nikolaos Polatidis, Stelios Kapetanakis, Elias Pimenidis

A Novel CNN-LSTM Hybrid Architecture for the Recognition of Human Activities

Sofia Stylianou-Nikolaidou, Ioannis Vernikos, Eirini Mathe, Evaggelos Spyrou, Phivos Mylonas

14:00-15:15

Session 43, AIAI: DEE-FZ (DEEP LEARNING-Fuzzy)

Chair: Prof. Kostas Delibasis

Intuitionistic Fuzzy Neural Network for Time Series Forecasting - The Case of Metal Prices

Petr Hajek, Vladimir Olej, Wojciech Froelich, Josef Novotny

Artificial Intelligence in Music Composition

Mincer Alaeddine, Anthony Tannoury

An Effective Loss Function for Generating 3D Models from Single 2D Image without Rendering

Nikola Zubić, Pietro Liò

Neural Network Compression Through Shunt Connections and Knowledge Distillation for Semantic Segmentation Problems

Bernhard Haas, Alexander Wendt, Axel Jantsch, Matthias Wess

Event-Detection Deep Neural Network for OTDR Trace Analysis**

Davide Rutigliano, Giacomo Boracchi, Pietro Invernizzi, Enrico Sozio, Cesare Alippi, Stefano Binetti

***EANN 2021 Paper*

14:00-15:00

Session 44, AIAI: DTM-ML (DATA MINING-MACHINE LEARNING)

Chair: Asst. Prof. Sotiris Kotsiantis

BIBLIOBICLUSTER: A bicluster algorithm for Bibliometrics

Gloria Gheno

Topic identification via human interpretation of word clouds: The case of Instagram hashtags

Stamatios Giannoulakis, Nicolas Tsapatsoulis

The Generative Adversarial Random Neural Network

Will Serrano

Validation and Verification for Data Marketplaces

Will Serrano

16:15-17:15

Session 45, Plenary 7: “Unveiling Recurrent Neural Networks – What Do They Actually Learn and How?”

Chair: Prof. Johan Suykens

Keynote Speaker: Prof. Peter Tino

School of Computer Science, University of Birmingham, UK

17:15-18:45

Session 46, TUTORIAL 3: MM_HUB

“Modern methods and tools for human biosignal analysis”

Chair: Prof. Ilias Maglogiannis

Tutor: **Prof. Vangelis Metsis**

Texas State University, USA

17:15-18:15

Session 47, Workshop: 5G-PINE III (5G – Putting Intelligence to the Network Edge III)

INDUSTRY/AI 5G TECHNOLOGY Organization by the Hellenic Telecommunications Organization Research Group

Chair: Dr. Ioannis Chochliouros

A Novel Architectural Approach for the Provision of Scalable and Automated Network Slice Management, in 5G and Beyond

Ioannis Chochliouros, Slawomir Kuklinski, Lechoslaw Tomaszewski, Christos Verikoukis, Anastasia Spiliopoulou, Alexandros Kostopoulos, Robert Kořakowski

The Challenge of Security Breaches in the Era of 5G Networking

Maria Belesioti, Jorge Carapinha, Rodoula Makri, Ioannis Chochliouros

Power Control in 5G Heterogeneous Cells considering User Demands using Deep Reinforcement Learning

Anastasios Giannopoulos, Sotirios Spantideas, Christos Tsinos, Panagiotis Trakadas

A prototype 5G/IoT implementation for transforming a legacy facility to a Smart Factory

Panagiotis Papaioannou, Nikolaos Tzanis, Christos Tranoris, Spyros Denazis, Alexios Birbas

17:45-18:45

Session 48, EANN: ML-SENT (MACHINE LEARNING-SENTIMENT ANALYSIS)

Chair: Prof. Elias Pimenidis

Improving the Diagnosis of Breast Cancer by Combining Visual and Semantic Feature Descriptors

George Apostolopoulos, Athanasios Koutras, Dionysios Anyfantis, Ioanna Christoyianni, Evangelos Dermatas

Contaminated Soil Detection: A proposal using Machine Learning with Hyperspectral imaging

Fernando Henrique Oliveira Duarte, Gustavo Pessin, Rosa Elvira Correa Pabón, Jefferson Souza

Predicting Stock Price Movement using Financial News Sentiment
Jiaying Gong, Bradley Paye, Gregory Kadlec, Hoda Eldardiry
Inverse Kinematics via a Network Ensemble and Learning Method
Joshua Ramayrat, Teng-Sheng Moh

17:45-18:45

Session 49, AIAI: ML-DL (MACHINE-DEEP LEARNING)

Chair: Prof. Doina Logofatou

Cross-lingual Approaches for Task-specific Dialogue Act Recognition

Jiří Martínek, Christophe Cerisara, Pavel Kral, Ladislav Lenc

Collaborative Edge-Cloud Computing for Personalized Fall

Anne Ngu, Shaun Coyne, Priyanka Srinivas, Vangelis Metsis

A Survey of Methods for Detection and Correction of Noisy Labels in Time Series Data

Gentry Atkinson, Vangelis Metsis

Deep Learning and AI for Optimization in 5G Technology

Mahnaz Olfati, Kiran Parma

17:15-18:30

Session 50, Workshop: EEAI (Energy Efficiency and Artificial Intelligence) / **Discussion Forum / Open Session**

Chair: Dr. Stelios Krinidis, Dr. Apostolos Tsolakis & Prof. Jasminko Novak

17:15-17:25 - Dr. Stelios Krinidis, Presentation of the SIT4Energy project

17:25-17:50 - Prof. Jasminko Novak, Intelligent Energy Management Tools for Prosumer Scenarios

17:50-18:10 - Dr. Siranush Akarmazyan, Improved customer experience via intelligent mobile applications

18:10-18:30 - Round table discussion

19:00-19:15 Closing Session

Webex Events Platform Access Links

Plenaries, Keynotes, Tutorials, and Invited Workshops

Sessions: 1, 7, 10, 18, 24, 30, 31, 36, 41, 45 & 46 (all Open Access)

[22nd EANN / 17th AIAI 2021, Open Plenaries & Tutorials Room](#)

22nd EANN 2021 Technical Sessions

Sessions: 2, 11, 15, 19, 25, 32, 37, 42 & 48

[22nd EANN / 17th AIAI 2021, Room A](#)

17th AIAI 2021 Technical Sessions

Sessions: 3, 8, 12, 20, 26, 33, 38, 43 & 49

[22nd EANN / 17th AIAI 2021, Room B](#)

Sessions: 21, 27, 39 & 44

[22nd EANN / 17th AIAI 2021, Room C](#)

Technical Workshops

5G-PINE 2021, [22nd EANN / 17th AIAI 2021, Workshops Room A](#)

6th Workshop on “5G – Putting Intelligence to the Network Edge”

Sessions: 13, 16 & 47

AI – BIO 2021, [22nd EANN / 17th AIAI 2021, Workshops Room B](#)

Artificial Intelligence in Biomedical Engineering and Informatics

Session: 17

DAAI 2021, [22nd EANN / 17th AIAI 2021, Workshops Room B](#)

Defense Applications of AI

Session: 35

DARE 2021, [22nd EANN / 17th AIAI 2021, Workshops Room A](#)

Distributed AI for Resource-Constrained Platforms

Session: 4

EEAI 2021, [22nd EANN / 17th AIAI 2021, Workshops Room A](#)

Energy Efficiency and Artificial Intelligence

Session: 34

MHDW 2021, [22nd EANN / 17th AIAI 2021, Workshops Room A](#)

10th Mining Humanistic Data Workshop

Sessions: 28 & 40

**Webex Events Platform Access Links
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DAAI 2021 Special Sessions & Discussion Forums

[22nd EANN / 17th AIAI 2021, Open Rooms / DAAI Special Session - Discussion Forum](#)

Distributed AI for Resource-Constrained Platforms

DARE 2021 Special Sessions & Discussion Forums

[22nd EANN / 17th AIAI 2021, Open Rooms / DARE Discussion Forum](#)

Energy Efficiency and Artificial Intelligence

EEAI 2021 Special Sessions & Discussion Forums

[22nd EANN / 17th AIAI 2021, Open Rooms / EAI Discussion Forum](#)

Designing a Novel Adaptive Cybersecurity Solution for Internet-of-Vehicle

nIoVw 2021 Special Sessions & Discussion Forums

[22nd EANN / 17th AIAI 2021, Open Rooms / NIoVe Discussion Forum](#)

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More info can be found under the “**Live Event**” section of the above web sites.