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5th International Workshop on New Approaches for Multidimensional Signal Processing NAMSP'2024

WORKSHOP PROGRAM

**Technical University of Sofia
Sofia, Bulgaria
July 25-27, 2024**



Springer

<http://rcvt.tu-sofia.bg/NAMSP2024>

General Information

The purpose of the workshop is to bring together researchers working in the various areas of Multidimensional Signal Processing and its applications in fields like Telecommunications, Computer Vision, Healthcare, Bioinformatics, Remote Ecological Monitoring, Agriculture, Forestry and others. The workshop proposes themes like: Multidimensional Image Processing, Sensor Heterogeneous Data Clustering, Spatio-Temporal Filtering, Multidimensional Interpolation, Multidimensional Object Segmentation, Multiview Representation, Multidimensional Visualization, Virtual and Augmented Reality and others. Authors are invited to present their recently achieved results, exchange ideas and cooperate in a friendly framework.

The Workshop will take place online with a host **TECHNICAL UNIVERSITY OF SOFIA, Sofia, Bulgaria, between the 25th and 27th of July 2024**. We hope that the participants will appreciate the predisposing environment for future collaboration.

The “International Workshop on New Approaches for Multidimensional Signal Processing” (NAMSP 2024) is part of the “Days of Science” at Technical University of Sofia, with the kind collaboration of the Research and Development Sector at TU of Sofia, Bulgaria.

We welcome you to NAMSP’2024!

Main topics of interest

Image Processing Specific Topics

- N-Dimensional (N-D) Multicomponent Image Processing
- Adaptive N-D Filtration in Intelligent Image Systems
- Multidimensional Image Representation and Super-Resolution
- Compression of Multidimensional Spatio-Temporal Images
- Multidimensional Image Transmission Systems
- Three-Dimensional (3D) Image Processing and Reconstruction
- Multidimensional (MD) Computer Vision Systems
 - Multidimensional Multimedia Systems
 - Reasoning-Based Intelligent Systems for MD Image Processing
- Intelligent Analysis of MD Medical Images
- Learning-Based MD Image Processing and Expert Systems
- Neural Networks for MD Image Processing
 - MD Image Preprocessing for Pattern Recognition
- Generic and Fuzzy Systems for MD Image Processing, Analysis and Recognition
 - Data-Based MD Image Retrieval and Knowledge Data Mining
- Watermarking, Hiding and Encryption of MD Images
- Surveillance Systems, Based on Intelligent MD Image Processing
- Objects Detection and Tracking, Based on MD Image Processing
- Intelligent Multi-Spectral and Hyper-Spectral Image Processing

- Intelligent Multi-View Image Processing
- Real-Time MD Image Processing Systems and Transmission
- MD Image Processing in Robot Systems
- Intelligent Visualization of MD Images
- Web-Based Search Systems for MD Images
- Forensic Analysis Systems for MD Images

General Data Processing and Generation Topics

- Pattern Recognition
 - Deep Learning
 - Machine Learning
 - Machine Intelligence
 - Neural Networks
 - Data Mining
- Tensor-based Data Processing
- Self-organization Modeling
 - Biomedicine
 - Biological Modeling
 - Bio-inspired Methods
- Biomedical Computing
 - Financial Modeling
 - Social Modeling
 - Medical Imagistic
 - Virtual Reality
 - Augmented Reality
- 3D and Multiview Visualization
 - Telepresence
 - Computer Graphics
 - Computer Animation
 - and others...

NAMSP'2024 Committees

Honorary Chair: *Prof. Lakhmi Jain, KES International, Selby, UK*

General Chairs:

Assoc. Prof. Rumen Mironov, Technical University of Sofia, Bulgaria

Prof. Srikanta Patnaik, Director, I.I.M.T., Bhubaneswar

Chairs: *Assoc. Prof. Ivo Draganov, Technical University of Sofia, Bulgaria*

Prof. Parvinder Singh, Full Professor, Department of Computer Science & Engineering, Deenbandhu Chhotu Ram University of Science & Technology, Murthal, Haryana, India

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Bin Hu, Co-Founder of IRnet International Academic Communication Center, China

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Prof. Parvinder Singh, Full Professor, Department of Computer Science & Engineering, Deenbandhu Chhotu Ram University of Science & Technology, Murthal, Haryana, India
Assoc. Prof. Ivo Draganov, Technical University of Sofia, Bulgaria

NAMSP'2024 Workshop Program

All Hours are Bulgarian Time (GMT+3)

July 25th, 2024 (Thursday)

Join Zoom Meeting Topic: NAMSP 2024 Meeting

Time: Jul 25, 2024 10:00 Sofia

<https://us06web.zoom.us/j/85361241397?pwd=qy2bFCDaOqIRa7DldEEazKGHQby7lh.1>

Meeting ID: 853 6124 1397

Passcode: 309981

10:00 – 10:30 Opening

Greetings from: Prof. Lakhmi Jain, Prof. Srikanta Patnaik

10:30-12:30 Plenary Session

Chairmen: Prof. Parvinder Singh, DCRUST, India

Assoc. Prof. Rumén Mironov, Technical University of Sofia, Bulgaria

- 10:30 – 11:00 Plenary Lecture 1:** *Prof. Srikanta Patnaik, The impact of AI on Sustainable Development Goal (SDG)*
- 11:00 – 11:30 Plenary Lecture 2:** *Wenfeng Wang, Intelligence in Decision Science - Theory, Applications and Beyond*
- 11:30 – 12:00 Plenary Lecture 3:** *Nazmy, T.M., Towards Artificial General Intelligence through Mimic the Brain Abilities*
- 12:00 – 12:30 Plenary Lecture 4:** *Yikui Zhai, Visual Object Detection and Recognition Advances and Applications*
- 12:30 – 13:00 Plenary Lecture 5:** *Singh, P., Frequency Reuse in Resource Scheduling for Next-Generation Networks*
- 13:00 – 13:30 Plenary Lecture 6:** *Milanova, M., The Art of Possibility: Blending Human Augmentation, and Generative AI for Creative Mastery*

13:30 – 14:00 Break

14:00 – 15:45 Paper Session 1: Intelligent Analysis of Multidimensional Signals

Chairman: Prof. Parvinder Singh, DCRUST, India

- 14:00 – 14:15** Kumari, R., Bharany, S., Kaur, K., Kaushik, K., Chhabra, G., *Systematic Mapping Study on Edge and Fog Computing in Smart Cities: A Comprehensive Review*
- 14:15 – 14:30** Kumari, S., Yadav, R., *High-speed Non-Volatile Spintronics Memory with Low Power*
- 14:30 – 14:45** Nisha Saini, N., Kumar, J., *Edge Computing: Virtualization Techniques for Performance Optimization and Management Analysis*
- 14:45 – 15:00** Singh, P., Mulyan, M., *Bird Call Identification*
- 15:00 – 15:15** Jangra, P., Duhan, M., *A brief introduction of In-Memory Computing*
- 15:15 – 15:30** Kumar, A., Duhan, M., Sheoran, P., *Electromyography based hand movement detection using machine learning algorithm*
- 15:30 – 15:45** Yadav, L., Duhan, M., *Performance Analysis of Digital Control Oscillator using Ant Colony Optimization*

15:45 – 16:00 Break

16:00 – 17:30 Paper Session 2: Multidimensional Signal Processing

Chairman: Assoc. Prof. Rumen Mironov, Technical University of Sofia, Bulgaria

- 16:00 – 16:15** Jain, L., Kountcheva, R., *Mip-Map Structure Solution Based on the Adaptive Inverse Difference Pyramid Decomposition with Deep Learning Parameters Setting*
- 16:15 – 16:30** Wickramasingha, I., Sherif, S., *Dynamic Tensor Least Angle Regression Using L1 Homotopy*
- 16:30 – 16:45** Draganov, I., *CT image compression with branched inverse difference pyramid*
- 16:45 – 17:00** Totev V., Kolev, S., Gueorgiev, V., *A study on the application of different types of electric motors as electric vehicles' drives*
- 17:00 – 17:15** Boyakhchyan, S., *SAR image processing*
- 17:15 – 17:30** Mironov, R., Kountcheva, R., Draganov, I., *Local Adaptive 3D Recursive Filtration of Multidimensional Images*
- 17.30 – 17.45** Nagy, S., *The application of fuzzy signatures and neural network in liver computed tomography image analysis*

July 26th, 2024 (Friday)

Join Zoom Meeting Topic: NAMSP 2024 Meeting

Time: Jul 25, 2024 10:00 Sofia

<https://us06web.zoom.us/j/85361241397?pwd=qy2bFCDaOq1Ra7DldEEazKGHQby7lh.1>

Meeting ID: 853 6124 1397

Passcode: 309981

10:00 – 11:30 Paper Session 1

Chairman: Prof. Wenfeng Wang, Int. Academy of Visual Art & Engineering, London, UK

Prof. Dr. Fuqing Li, Xiangtan University, China

- 10:00 – 10:15** Xu Zhao, Xiaoyuan Liu, Man Cheng, Dajun Yang, Yuhan Li and Congyan Qi, A SOM Algorithm for Chronic Hepatitis B Drug Expenditure Forecast
- 10:15 – 10:30** Yulin Tang, Construction of Knowledge Map and Design of Decision Support System for Diagnosis of Tumor Disease
- 10:30 – 10:45** Jie You, Hufei Zhu, Kanghong Tan, Xinru Li, Yijun Zhou, Bo Li, Dongyan Lin, Yingwen Chen, Yikui Zhai, Performance Evaluation of Surface Defect Segmentation with an Novel Battery Surface RGB Dataset
- 10:45 – 11:00** Chengxuan Wang, Chaojun Dong*, Ye Li, Xiankun Liu, Jianhong Zhou, Yikui Zhai, Performance Evaluation of Workpiece Counting Neural Network with a Novel Sketch Dataset for Reducing Background Noise
- 11:00 – 11:15** Xue-Jiao Zhang, Wen-Feng Wang, Bin Hu, Jing-Jing Zhang, Lalit Mohan Patnaik, Jamming Image Recognition Problem
- 11:15 – 11:30** Bin Hu, Sohail M. Noman, Ying Zhang, Ifrah Malik, Fuqing Li, An Introductory Glimpse of Machine Learning Applications in Multidimensional Signal Analysis

11:30 – 12:00 Break

12:30 – 13:45 Paper Session 2

Chairman: Prof. Dr. Fuqing Li, Xiangtan University, China

Dr. Sohail M. Noman, Linkoping University, Sweden

- 12:30 – 12:45** Noman Sohail, Bin Hu, Fuqing Li, Multidimensional Signal Analysis of Colorectal Cancer Using Virtue Laboratory Techniques
- 12:45 – 13:00** Ruyi Sheng, Intelligent Design System of Environmental Art Based on the Concept of Sustainable Development

- 13:00 – 13:15** *Yu Yuan, Research on Image Enhancement Technology Based on Semi-Supervised Learning for Oil Painting Image*
- 13:15 – 13:30** *Guannan Liu, Design of Publicity Animation Sample Based on Dynamic Simulation Technology*
- 13:30 – 13:45** *Xueying Bai, Yiwen Chen, Chunhui Zhang, A Deep Learning-based Study of Adolescents' Self-Esteem Developmental Patterns: Exploring the Intersection of Psychology and Data Science*

14:00 Closing

Plenary Speakers



Prof. Dr. Srikanta Patnaik, Department of Computer Application & Business Analytics, Interscience Institute of Management & Technology, Bhubaneswar, Odisha, India

Title of Lecture:
The impact of AI on Sustainable Development Goal (SDG)

Abstract: United Nations Organization in the General Assembly has adopted Sustainable Development Goal (SDG) in 2015. There are 17 SDG Goals, which was built upon "leaving no one behind" principle. They were adopted for: Better Environment, Better Society, and Better Economy.

The major challenges for the world are to provide clean water, clean air, natural resources, sustainable energy, and education. As we all know that there are so many problems we are facing with environments, problems with people like poverty and starvation. So far with the advancement of technological growth, we did not succeed with these problems yet. Let us now see whether Artificial Intelligence can help to solve such problems. The talk will bring the learning Outcomes as follows:

- i) To identify and appreciate Generative Artificial Intelligence and describe its applications in daily life.
- ii) To relate, apply and reflect on the Human-Machine Interactions.
- iii) To identify and interact with the three domains of AI: Data, Computer Vision and Natural Language Processing.
- iv) To undergo an assessment for analysing progress towards acquired Generative AI-Readiness skills.
- v) To imagine, examine and reflect on the skills required for futuristic job opportunities.
- vi) Social Legal & Ethical Implications of Generative Artificial Intelligence in their daily lives.
- vii) To unleash their imagination towards smart homes and build an interactive story around it.
- viii) To relate, apply and reflect on the Human-Machine Interactions
- ix) To understand the impact of Generative Artificial Intelligence on Sustainable Development Goals to develop responsible citizenship
- x) To do further study and develop awareness of Social & Ethical Implications of the future jobs of the future by robots.
- xi) To imagine, examine and reflect on the skills required for the futuristic opportunities.
- xii) To develop effective communication and collaborative work skills.
- xiii) To understand and reflect on the ethical issues around AI.
- xiv) To gain awareness around AI bias and AI access.
- xv) To let the students analyse the advantages and disadvantages of Artificial Intelligence

Biographical Notes: Prof. Srikanta Patnaik has received his Bachelor in Engineering from University College of Engineering, Burla (presently VSSUT, Burla) in 1989, MBA from Sambalpur University in 1991 and Ph. D. (Engineering) from Jadavpur University, India in 1999. He has served at University College of Engineering, Burla and Fakir Mohan University and SOA University for more than 30 years. Presently, Prof. Srikanta Patnaik is Director of I.I.M.T., Bhubaneswar, which is an AICTE approved management institute.

He has supervised more than 30 Ph. D. Theses and 100 Master theses in the area of Computational Intelligence, Machine Learning, Soft Computing Applications and Re-Engineering. Dr. Patnaik has published more than 100 research papers in international journals and conference proceedings. He is author of 3 text books and edited more than 100 books and few invited book chapters, published by leading international publisher like IEEE, Elsevier, Springer-Verlag, Kluwer Academic, IOS Press and SPIE.

Dr. Srikanta Patnaik is the Editors-in-Chief of International Journal of Information and Communication Technology and International Journal of Computational Vision and Robotics published from Inderscience Publishing House, England and, Editor of Journal of Information and Communication Convergence Engineering and Associate Editor of Journal of Intelligent and Fuzzy Systems (JIFS). He is also Editors-in-Chief of Book Series on “Modeling and Optimization in Science and Technology” published from Springer, Germany and Advances in Computer and Electrical Engineering (ACEE) and Advances in Medical Technologies and Clinical Practice (AMTCP), published by IGI Global, USA.

Prof. Patnaik is a Guest Professor to Hunan University of Finance and Economics, Changsha and Kunming University of Science and Technology, Kunming, China and visiting professors to some of the B-Schools of Europe and South East Asia.

Prof. Patnaik is awarded with MHRD Fellowship by the Government of India, for the year 1996. He is nominated for MARQUIS Who’s Who for the year 2004 and nominated as International Educator of the Year 2005 by International Biographical Centre, Great Britain. He has been awarded with the certificate of merit for the best paper entitled “Face recognition by ANN using wavelet Transform Coefficients” by The Institute of Engineers (India) for the year 2004-05.

He is a member of Institute of Electrical and Electronics Engineering (IEEE) and Association for Computing Machinery (ACM). He is also Fellow of IETE, Life Member of ISTE, and CSI. Dr. Patnaik has visited various countries such as Japan, China, Hong Kong, Singapore, Indonesia, Iran, Malaysia, Philippines, South Korea, United Arab Emirates, Morocco, Algeria, Thailand and Vietnam for delivering Key note addresses at various conferences and symposiums.



Prof. Dr. Wenfeng Wang, International Academy of Visual Art and Engineering, London, UK

Title of Lecture:

Intelligence in Decision Science - Theory, Applications and Beyonds

Abstract: Decision science is experiencing an evolution driven by machine intelligence and the optimized productivity. Theoretically, intelligent decision has been conjectured as the fourth intelligence layer in the machine brain. Such theory were developed from deep multiview active Learning, broad learning and robust metalearning technologies for rapid classification in large-scale decisions. Applications of intelligence in decision science attracted much attention. Especially in clinical decisions, real-time and precise decisions improved the cure rate of many patients. Since AI is already an important tool to assist people in decision-making, we should manage and undoubtedly ensure the fairness and inclusiveness of AI. It is very important to consider whether AI will have a more adverse impact on the vulnerable groups when making intelligent decisions, especially those with high influences.

Biographical Notes: Professor Dr. Wenfeng Wang is currently the editor in chief of International Journal of Electrical and Electronics Engineering (IJEEE) and International journal of Applied Nonlinear Science (IJANS). He is also a professor in Shanghai Institute of Technology. He is the director of International Academy of Visual Art and Engineering in London and the JWE Technological Research Center in Shanghai. He is also a tenured professor in IMT Institute in India and the director of Sino-Indian Joint research center of artificial intelligence and robotics. He was selected in 2018 as a key tallent in Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences. He is a reviewer of many SCI journals, including some top ones - Water Research, Science China-Information Sciences, Science of the Total Environment, Environmental Pollution, IEEE Transactions on Automation Science and Engineering and etc. He served as a keynote speaker of AMICR2019, IACICE2020, OAES2020, 3DIT-MSP&DL2020, NAMSP2021, ICCAES 2021, CSAMCS 2021 and etc.



**Prof. Taymoor Mohamed Nazmy, Department of Computer Science,
Faculty of Computer and Information Systems, Ain Shams University,
Cairo, Egypt**

Title of Lecture:
Towards Artificial General Intelligence through Mimic the Brain Abilities

Abstract: This talk will be divided into two parts. The first part (is a review of recent technologies related to Ai, generative, and cognitive intelligence), will focus on describing a set of modern technologies that help towards drawing the road map of general artificial intelligence era.

The emergence of large language models, along with generative intelligence tools, as well as, the systems that support artificial cognition and herald the possibility of artificial consciousness, all of these technologies have become intertwined and are going to be integrated to reach systems that are expected to surpass human intelligence in the near future.

The second part, (is a research work on spiking neural networks applications), emphasizes the importance of using Spiking Neural Networks (SNNs) that are more biologically realistic than traditional Artificial Neural Networks (ANNs). Some result on pulse coupled neural network (PCNN) as one type of SNNs will be presenting for image processing applications.

Biographical Notes: Taymoor Mohamed Nazmy is a Professor in the Department of Computer Science, Faculty of Computer and Information Systems, at Ain Shams University, Cairo, Egypt, where he has been a Professor since 2006.

From 2005, to 2006 he served as University information network director. From 2006 to 2017 he served as vice dean for postgraduate studies, and vice dean for environmental affairs.

Between 2017-2021 he worked as a professor in computer science at Qassim University, Saudi Arabia. He received a B.S. from Ain Shams University in 1982, and an M.Sc. in 1987, Ph.D. Karlsruhe University Germany, during his work in Germany he was a principal investigator for a project funded by European space agency, 1990.

He participates in many international and local conferences. He was the executive chair of ICICIS, 2015, 2017 held in Cairo.

He was a director of more than one funded projects run by Ain Shams university.

His research interests span image processing, pattern recognition, artificial intelligence, neural networks.

He worked as papers reviewer, as well as editorial board member, in many international journals. He published about 80 papers in international journal and conferences. He supervised about 20 M.Sc., and Ph.D. thesis.

His current interest topics include generative AI, transformers, and large language models.



Prof. Yikui Zhai, Wuyi University, China,

Title of Lecture:
Visual Object Detection and Recognition Advances and Applications

Abstract: In the wave of artificial intelligence, visual object detection and recognition technology has become a key force driving the development of various fields, such as industrial automation, precision agriculture, environmental monitoring, and national security. We will provide a comprehensive review of the advancements and latest research achievements in this technology, particularly in the areas of industrial visual inspection, UAV target detection, and satellite imagery target detection and recognition. In industrial visual inspection, we delve into the application of object detection technology in automated steel production. We focus on how to cleverly address the issues of intra-class variation and inter-class confusion in steel quantity statistics, significantly improving production efficiency and accuracy. In UAV object detection section, we innovatively apply bi-temporal image technology to enhance detection precision and timeliness in crucial areas such as land monitoring and disaster assessment. In satellite image object detection and recognition, we analyze the application of object detection technology in urban planning, environmental monitoring, and military reconnaissance, and particularly address the challenges of improving detection and recognition accuracy in small sample scenarios and propose corresponding solutions. In the future, with continuous technological advancements and innovations, we believe that visual object detection and recognition technology will play a critical role in more fields, driving the intelligent and automated development of various aspects of society.

Biographical Notes: Prof. Yikui Zhai received his Ph.D. degree in signal and information processing from Beihang University, Beijing, China, in June 2013. Since October 2007, he has been working with Wuyi University, Jiangmen, China, where he is a Full Professor now. He is also Associate Dean of the School of Electronics and Information Engineering in Wuyi University, since 2021. He has been a Visiting Scholar with Department of Computer Science, the Università degli Studi di Milano, Italy, during June 2016 to June 2017, August 2023 and January 2024. His research interests include: Image Processing, Deep Learning, Optical Character Recognition, Object Detection, UAV Change Detection, Self Supervise Learning.



Prof. Dr. Parvinder Singh, Full Professor, Department of Computer Science & Engineering, Deenbandhu Chhotu Ram University of Science & Technology, Murthal, Haryana, India

Title of Lecture:

Rice Leaves Disease Detection using Convolutional Neural Network Techniques

Abstract: The world's population is expected to increase by 2 billion persons in the next 30 years, from 7.7 billion currently to 9.7 billion in 2050, and can peak at nearly 11 billion around 2100. Most of the world's population regards rice as the primary grain, and it is the source of a substantial portion of total calories for over half the earth's population. Like other plants, rice is susceptible to diseases that may affect the quantity and quality of produce. It sometimes results in anywhere between 20–40% crop loss productions. Early detection of these diseases can positively affect the harvest, and thus, farmers would have to be knowledgeable about the various disease and how to identify them visually. Even then, it is an impossible task for farmers to survey the vast farmlands daily. Even if this is possible, it becomes a costly task that will in turn increase the price of rice for consumers. So, an automated system is needed, this research methodology proposed a novel SS-PEDCNN-based rice plant disease detection with a severity assessment system. Initially, the contrast level of the input image is enhanced to avoid various factors, such as illumination variations using CLT-DPHE. Then, the background of the input image is removed to reduce the complexity of the input image using SE-GMM. After that, the separate parts (i.e., stem, sheath, leaf) of the input plant by considering the outer shape of the input image, is segmented using CDSO-ARG; then, each part of the input image color is transformed because the color is varying for different diseases. Then, based on the different color models of different parts, the input image is clustered as healthy and diseased. From the disease parts, the features are extracted, and the features are given as input to the SS-PEDCNN classifier, which predicts the rice stem rot, rice sheath spot, rice sheath rot, bacterial leaf streak, leaf smut, rice kernel smut, rice sheath, blight, leaf scald, rice stack burn, and rice blast diseases. From the disease, the severity level is predicted by using POI with the fuzzy rule.

Biographical Notes: Present position: Full Professor, Department of Computer Science & Engineering, Deenbandhu Chhotu Ram University of Science & Technology, Murthal, Haryana, India.

Administrative experience: Dean Faculty of IT & CS, DCRUST, Murthal Chairperson CSED, DCRUST Murthal, Professor Incharge Security, DCRUST Murthal, Director PG Admission, DCRUST Murthal

Teaching experience: Total experience - 28 years, Presently working at Deenbandhu Chhotu Ram University of Science & Technology, Murthal, Haryana (India) (DCRUST), Completed 2 terms as Chairman, Department of Computer Science & Engineering, DCR University of Science & Technology, Murthal, Honorary Visiting Professor, University of Deusto, Spain, Worked on India Bulgaria Joint Project with Technical University of Sofia, Working in Collaboration with University of Deusto, Spain, Received two Patents (One International and One Indian) in the field of Security and Image Processing, Awarded two grants from DST and one from UGC for major projects, Organized International and National Workshops/Conferences in various cities of the world and delivered Keynote Address, Biography published in 27th edition of Marquis Who's is Who in World 2010 and all the subsequent editions, Inclusion in the Top 100 Engineers - 2012 by Cambridge, England, Published more than 100 Papers in International Journal and Conference Proceedings



Prof. Mariofanna Milanova, Professor in Computer Science, University of Arkansas at Little Rock, USA

Title of Lecture:

The Art of Possibility: Blending Human Augmentation, and Generative AI for Creative Mastery

Abstract: During the presentation, we'll explore the implementation of Generative Artificial intelligence models such as Transformer, Variational Autoencoder (VAE), Generative Adversarial Network (GAN), and Diffusion Models (DALL E 3). New Foundational models introduce a cutting-edge methodology and overcome manual labeling and model transferability challenges. Outcomes are showcased utilizing various datasets. All participants will receive a personal code to access NVIDIA online courses for free.

Biographical Notes: Dr. Mariofanna Milanova is a professor in the Department of Computer Science at UA Little Rock and has been a faculty member since 2001. She received a M.Sc. in Expert Systems and Artificial Intelligence and Ph.D. in Engineering and Computer Science from the Technical University, Sofia, Bulgaria. Dr. Milanova conducted post-doctoral research in visual perception at the University of Paderborn, Germany. Dr. Milanova has extensive academic experience at various academic and research organizations worldwide.

Dr. Milanova is an IEEE Senior Member, Fulbright U.S. Scholar, and NVIDIA Deep Learning Institute University Ambassador. Dr. Milanova's work is supported by NSF, NIH, DARPA, DoD, Homeland Security, NATO, Nokia Bell Lab, NJ, USA and NOKIA, Finland. She has published more than 120 publications, over 53 journal papers, 35 book chapters, and numerous conference papers. She also has two patents.