



EECSS 2021

7TH WORLD CONGRESS ON ELECTRICAL ENGINEERING AND COMPUTER SYSTEMS AND SCIENCE (EECSS'21)

July 29 - 31, 2021 | ~~Prague, Czech Republic~~ | **Virtual Conference**

EECSS'21

JULY 30

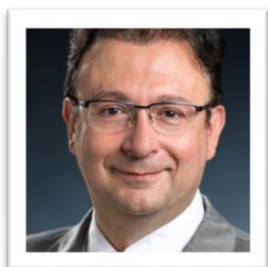
JULY 31

**OUR PROGRAM SCHEDULE IS BASED ON EASTERN TIME
(ET - OTTAWA TIME)**

EECSS'21

10:00 AM – 12:00 PM Registrations – Thursday 29 July, 2021

EECSS'21 Scientific Committee Chair



Dr. Luigi Benedicenti

University of New Brunswick, Canada
Congress Chair

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Dr. Zheng Liu

University of British Columbia, Canada
Congress Co-Chair

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JULY 30

8:00 AM - 9:00 AM	Registrations
9:00 AM - 9:10 AM	Official Opening
	Dr. Luigi Benedicenti, University of New Brunswick, Canada & Dr. Zheng Liu, University of British Columbia, Canada
9:10 AM - 10:10 AM	PLENARY LECTURE
	<u>Towards Automating the Data Analytics Process</u> Dr. Chris Williams, University of Edinburgh, UK
10:10 AM - 10:55 AM	PLENARY LECTURE
	<u>Modern Hopfield Networks</u> Dr. Sepp Hochreiter, Johannes Kepler University, Austria
10:55 AM - 11:00 AM	Break
11:00 AM - 12:05 PM	Session <u>Biomedical Science and Engineering I</u>
12:05 PM - 12:25 PM	Lunch Break

JULY 30

12:25 PM - 1:25 PM

PLENARY LECTURE

How Can Machine Learning Help Computer Vision in the Next Decade?

Dr. Max Welling, University of Amsterdam, Netherlands

1:25 PM - 2:10 PM

KEYNOTE LECTURE

Reinforcement Learning for Large-Scale Communications and Computer Infrastructures

Dr. Kin K. Leung, Imperial College London, UK

2:10 PM - 2:15 PM

Break

2:15 PM - 3:30 PM

Session

Artificial Intelligence

3:30 PM - 3:40 PM

Break

3:40 PM - 4:25 PM

Session

Electrical Engineering and Electronics I

MVML PLENARY LECTURE

JULY 30 | 9:10 AM - 10:10 AM | SESSION CHAIR: DR. LUIGI BENEDECENTI, UNIVERSITY OF NEW BRUNSWICK, CANADA



Titles: Towards Automating the Data Analytics Process

[Dr. Chris Williams, University of Edinburgh, UK](#)

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Chris Williams is Professor of Machine Learning and Director of Research in the School of Informatics, University of Edinburgh. His main areas of research are in visual object recognition and image understanding, models for understanding time-series, AI for data analytics, unsupervised learning, and Gaussian processes. He obtained his MSc (1990) and PhD (1994) at the University of Toronto, under the supervision of Geoff Hinton. He was elected a Fellow of the Royal Society of Edinburgh in 2021, is a Fellow of the European Laboratory for Learning and Intelligent Systems (ELLIS), a Turing Fellow at the Alan Turing Institute (UK), and was program co-chair of the NeurIPS conference in 2009.

MVML PLENARY LECTURE

JULY 30 | 10:10 AM -10:55 AM | SESSION CHAIR: DR. LUIGI BENEDICENTI, UNIVERSITY OF NEW BRUNSWICK, CANADA



Titles: Modern Hopfield Networks
Dr. Sepp Hochreiter, Johannes Kepler University, Austria

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Sepp Hochreiter is heading the Institute for Machine Learning, the LIT AI Lab and the AUDI.JKU deep learning center at the Johannes Kepler University of Linz and is director of the Institute of Advanced Research in Artificial Intelligence (IARAI). He is regarded as a pioneer of Deep Learning as he discovered the fundamental deep learning problem: deep neural networks are hard to train, because they suffer from the now famous problem of vanishing or exploding gradients. He is best known for inventing the long short-term memory (LSTM) in his diploma thesis 1991 which was later published in 1997. LSTMs have emerged into the best-performing techniques in speech and language processing and are used in Google's Android, in Apple's iOS, Google's translate, Amazon's Alexa, and Facebook's translation. Currently, Sepp Hochreiter is advancing the theoretical foundation of Deep Learning, investigates new algorithms for deep learning, and reinforcement learning. His current research projects include Deep Learning for climate change, smart cities, drug design, for text and language analysis, for vision, and in particular for autonomous driving.

SESSION

BIOMEDICAL SCIENCE AND ENGINEERING I

JULY 30 | 11:00 AM - 12:05 PM | SESSION CHAIR: DR. ZHENG LIU, UNIVERSITY OF BRITISH COLUMBIA, CANADA & DR. KYRIN LIONG, SINGAPORE INSTITUTE OF TECHNOLOGY, SINGAPORE

Titles: Simple Pin-Plate Electrode Configuration for Targeted Electroporation
ICBES 103

Time: 11:00 - 11:15

Presenter: Anoop Menachery, Malta College of Arts, Science and Technology, Malta

Authors: Ayoola Brimmo, Mohammad Qasaimeh, Anoop Menachery

Titles: Naturally Occurring Polyhydroxyalkanoate (PHA)- Based Scaffolds Used For In Vitro Tissue Engineering Applications

ICBES 109

Time: 11:15 - 11:30

Presenter: Eleni Chatzilakou, Aristotle University of Thessaloniki, Greece

Authors: Eleni Chatzilakou, Olga Tsave, Christos Chatzidoukas

Titles: Rapid Detection of Wound Pathogen *Proteus mirabilis* Using Disposable Electrochemical Sensors

ICBES 105

Time: 11:30 - 11:45

Presenter: Aiden J Hannah, University of Strathclyde, UK

Authors: Aiden J Hannah, Andrew C Ward, Patricia Connolly

Titles: Model of Magnetic Spherical Micro-Robot Motion in Soft Media
ICBES 111

Time: 11:45 - 11:50

Presenter: Yulia Malkova, Drexel University, USA

Authors: Yulia Malkova, Sijie, Ran, Gary Friedman

Titles: Using Deep Learning for Efficient Diagnoses of COVID-19, Viral Illnesses (Other than COVID-19), and Bacterial Illnesses

ICBES 112

Time: 11:50 - 12:05

Presenter: Vibha Addala, Jesuit High School, USA

Authors: Vibha Addala

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MVML PLENARY LECTURE

JULY 30 | 12:25 PM - 13:25 PM | SESSION CHAIR: DR. ZHENG LIU, UNIVERSITY OF BRITISH COLUMBIA, CANADA



Titles: How Can Machine Learning Help Computer Vision in the Next Decade?
[Dr. Max Welling, University of Amsterdam, Netherlands](#)

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Prof. Dr. Max Welling is a research chair in Machine Learning at the University of Amsterdam (AMLAB) and a VP Technologies at Qualcomm. He is a fellow at the Canadian Institute for Advanced Research (CIFAR) and at the European Lab for Learning and Intelligent Systems (ELLIS). Max Welling has served as associate editor in chief of IEEE TPAMI from 2011-2015 and is on the board of the NeurIPS foundation since 2015 and has been program chair and general chair of NeurIPS in 2013 and 2014 respectively. He was also program chair of AISTATS in 2009 and ECCV in 2016 and general chair of MIDL 2018. He is recipient of the ECCV Koenderink Prize in 2010. Welling is co-founder and board member of the Innovation Center for AI (ICAI) and the European Lab for Learning and Intelligent Systems (ELLIS). He directs the Amsterdam Machine Learning Lab (AMLAB), and co-directs the Qualcomm-UvA deep learning lab (QUVA), the Bosch-UvA Deep Learning lab (DELTA) and the Amsterdam ELLIS Unit.

CIST KEYNOTE LECTURE

JULY 30 | 1:25 PM -2:10 PM | SESSION CHAIR: DR. ZHENG LIU, UNIVERSITY OF BRITISH COLUMBIA, CANADA



Titles: Reinforcement Learning for Large-Scale Communications and Computer Infrastructures

[Dr. Kin K. Leung, Imperial College London, UK](#)

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Kin K. Leung received his B.S. degree from the Chinese University of Hong Kong in 1980, and his M.S. and Ph.D. degrees from University of California, Los Angeles, in 1982 and 1985, respectively. He joined AT&T Bell Labs in New Jersey in 1986 and worked at its successor companies until 2004. Since then, he has been the Tanaka Chair Professor in the Electrical and Electronic Engineering (EEE), and Computing Departments at Imperial College in London. He serves as the Head of Communications and Signal Processing Group in the EEE Department at Imperial. His current research focuses on optimization and machine-learning techniques for system design and control of large-scale communication networks and computer infrastructures. He also works on multi-antenna and cross-layer designs for wireless networks.

He received the Distinguished Member of Technical Staff Award from AT&T Bell Labs in 1994, and was a co-recipient of the 1997 Lanchester Prize Honorable Mention Award. He was elected as an IEEE Fellow in 2001. He received the Royal Society Wolfson Research Merits Award from 2004 to 2009 and became a member of Academia Europaea in 2012. Along with his co-authors, he also received the IEEE ComSoc Leonard G. Abraham Prize (2021) and several best conference paper awards, including the IEEE PIMRC 2012, ICDCS 2013 and ICC 2019. He serves as a member (2009-11) and the chairman (2012-15) of the IEEE Fellow Evaluation Committee for Communications Society. He was a guest editor for the IEEE JSAC, IEEE Wireless Communications and the MONET journal, and as an editor for the JSAC: Wireless Series, IEEE Transactions on Wireless Communications and IEEE Transactions on Communications. Currently, he chairs the Steering Committee for the IEEE Transactions on Mobile Computing and is an editor for the ACM Computing Survey and International Journal on Sensor Networks.

SESSION

ARTIFICIAL INTELLIGENCE

JULY 30 | 02:15 PM - 03:30 PM | SESSION CHAIR: DR. ZHENG LIU, UNIVERSITY OF BRITISH COLUMBIA, CANADA

Titles: Detection of Adversarial DDoS Attacks Using Generative Adversarial Networks with Dual Discriminators

CIST 121

Time: 02:15 - 02:30

Presenter: Chin-Shiuh Shieh, National Kaohsiung University of Science and Technology, Taiwan

Authors: Chin-Shiuh Shieh, Wan-Wei Lin, Thanh-Tuan Nguyen, Yong-Lin Huang, Mong-Fong Horng, Chun-Chih Lo, and Kun-Mu Tu

Titles: Processing Natural Language Queries in Semantic Web Applications

CIST 108

Time: 02:30 - 02:45

Presenter: Neli Zlatareva, Central Connecticut State University, USA

Authors: Neli Zlatareva, Devansh Amin

Titles: Short-Term Traffic Forecasting Using Deep Learning

MVML 102

Time: 02:45 - 3:00

Presenter: Iren Valova, University of Massachusetts Dartmouth, USA

Authors: Iren Valova, Natacha Gueorguieva, Sandeep Smudidonga

Titles: Analysing the Sentiments in a Hybrid FLOSS Community based on Commits

CIST 111

Time: 03:00 - 03:15

Presenter: Luigi Benedicenti, University of New Brunswick, Canada

Authors: Luigi Benedicenti, Tommi Mikkonen, Jurka Rahikkala

Titles: Detecting Emotional Contagion in OSS Projects

CIST 301

Time: 03:15- 03:30

Presenter: Luigi Benedicenti, University of New Brunswick, Canada

Authors: Rashmi Dhakad, Luigi Benedicenti

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SESSION

ELECTRICAL ENGINEERING AND ELECTRONICS I

JULY 31 | 03:40 PM - 4:10 PM | SESSION CHAIR: DR. LUIGI BENEDICENTI, UNIVERSITY OF NEW BRUNSWICK, CANADA

Titles: Modified Parareal Algorithm for Solving Time-Dependent Differential Equations

EEE 110

Time: 03:40 - 03:55

Presenter: Sumathi Lakshmiranganatha, University of Wyoming, USA

Authors: Sumathi Lakshmiranganatha, Suresh S. Muknahallipatna

Titles: Integration of Renewable Energy Systems to Reduce Greenhouse Gas Emission

EEE 105

Time: 03:55 - 04:10

Presenter: Nurul Chowdhury, University of Saskatchewan, Canada

Authors: Asim Chaulagain, Muhammad Ahsan Khalil, Raynier Leyeza, Ramakrishna Gokaraju, Nurul Chowdhury, Chris James

Titles: Cloud Computing based Real Time Monitored Supply Chain System
CIST 302

Time: 04:10 - 04:25

Presenter: Usama Zafar Ansari, University of British Columbia, Canada

Authors: Usama Zafar Ansari, Zheng Liu

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JULY 31

9:00 AM - 9:45 AM

KEYNOTE LECTURE

Natural Language Processing for Biomedicine

Dr. Sophia Ananiadou, University of Manchester, UK

9:45 AM - 10:45 AM

PLENARY LECTURE

Forward Engineering of Multi-cellular Engineered Living Systems

Dr. Rashid Bashir, University of Illinois, USA

10:45 AM - 11:45 AM

PLENARY LECTURE

The Use of Gaze in Human and Machine Vision

Dr. Dana Ballard, University of Texas at Austin, USA

11:45 AM - 11:50 AM

BREAK

11:50 AM - 01:05 PM

SESSION

Biomedical Science and Engineering II

01:05 PM - 01:25 PM

LUNCH BREAK

01:25 PM - 02:25 PM

PLENARY LECTURE

From Differentiable Reasoning to Self-supervised Embodied Active Learning

Dr. Ruslan Salakhutdinov, Carnegie Mellon University, USA

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JULY 31

02:25 PM - 03:10 PM **KEYNOTE LECTURE**

A Novel Optical Coherence Tomography for Non-Destructive Characterisation of Electrical-Thermal-Mechanical Deformation of Bonding Wires

Dr. Yao-chun Shen, University of Liverpool, UK

3:10 PM - 3:15 PM **Break**

03:15 PM - 04:00 PM **SESSION**
Electrical Engineering and Electronics II

04:00 PM - 04:05 PM **Break**

04:05 PM – 04:50 PM **SESSION**
Machine Learning and Human Computer Interaction

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CIST KEYNOTE LECTURE

JULY 31 | 9:00 AM - 9:45 AM | SESSION CHAIR: DR. LUIGI BENEDICENTI, UNIVERSITY OF NEW BRUNSWICK, CANADA



Titles: Natural Language Processing for Biomedicine

Dr. Sophia Ananiadou, University of Manchester, UK

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Sophia Ananiadou is Professor of Computer Science at The University of Manchester. Her main research areas of research are Natural Language Processing and Text Mining applied in Biomedicine. She is the Director of the UK National Centre for Text Mining, a Turing Fellow, ELLIS member and Distinguished research fellow at the AI research centre (AIST Japan). Her research has covered: information extraction, scientific discourse analysis, emotion detection, automatic extraction of terminology for applications such as systematic reviews , semantic search, knowledge graph construction, pathway curation.

ICBES PLENARY LECTURE

JULY 31 | 09:45 AM - 10:45 AM | SESSION CHAIR: DR. LUIGI BENEDECENTI, UNIVERSITY OF NEW BRUNSWICK, CANADA



Titles: Forward Engineering of Multi-cellular Engineered Living Systems
[Dr. Rashid Bashir, University of Illinois, USA](#)

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Rashid Bashir is currently the Dean of Grainger College of Engineering, the Grainger Distinguished Chair in Engineering, and Professor of Bioengineering at the University of Illinois at Urbana-Champaign. He was member of the core founding team and co-chair of the inaugural curriculum committee for the Carle-Illinois College of Medicine, the world's first engineering based College of Medicine at the University of Illinois at Urbana-Champaign. He has previously been at Purdue University and at National Semiconductor Corporation. He has held a visiting Scientist position at Massachusetts General Hospital and Shriners's Hospital for Children, and was Visiting Professor of Surgery at Harvard Medical School, Cambridge, MA. He was the recipient of the Joel and Spira teaching Award, the NSF Faculty Early Career Award and the IEEE EMBS Technical Achievement award. In 2018, he received the Pritzker Distinguished Lectureship Award from BMES. His research group is interested in developing new diagnostic technologies for precision and personalized medicine, and in 3D bio-fabrication of cellular systems. Using bionanotechnology, BioMEMS, and lab on chip, he is working at the interface of biology and engineering from the molecular to the tissue scale, and aiming to make an impact on grand challenges in infectious disease, sepsis, cancer, and others. He has authored or co-authored over 250 journal papers and has been granted 50 patents. Technology from his group has been licensed to multiple startups and larger companies.

MVML PLENARY LECTURE

JULY 31 | 10:45 AM - 11:45 AM | SESSION CHAIR: DR. LUIGI BENEDECENTI, UNIVERSITY OF NEW BRUNSWICK, CANADA



Titles: The Use of Gaze in Human and Machine Vision

Dr. Dana Ballard, University of Texas at Austin, USA

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Dana Ballard received his PhD from the University of California, Irvine, in 1974. His main research interest is in computational theories of the brain with emphasis on human vision and motor control. Currently Ballard is interested in pursuing this research by using high DOF models of humans' natural behavior in virtual reality environments.

SESSION

BIOMEDICAL SCIENCE AND ENGINEERING II

JULY 31 | 11:50 AM – 01:05 PM | SESSION CHAIR: DR. IREN VALOVA, UNIVERSITY OF MASSACHUSETTS DARTMOUTH, USA

Titles: Investigation of Two Double Throws and Three Single Throws Square Surgical Knots – A Preliminary Experimental & Computational Study on Knot Integrity

ICBES 118

Time: 11:50 - 12:05

Presenter: Kyrin Liong, Singapore Institute of Technology (University of Glasgow), Singapore

Authors: Amery Chow, Kyrin Liong, Shujin Lee

Titles: Sensitivity Analysis of Heart Rate Variability Analysis Algorithms

ICBES 113

Time: 12:05 - 12:20

Presenter: Abraham Otero, Universidad San Pablo-CEU, Spain

Authors: Amanda Pérez-Porro, María Palacios, Constantino Antonio García, Gabriel Caffarena, Abraham Otero

Titles: Magnetic Resonance Spectroscopy Signal Analysis Based on Fingerprinting Dictionary Approaches

ICBES 114

Time: 12:20 - 12:35

Presenter: Iurii Venglovskiy, Brno University of Technology, Czech Republic

Authors: Iurii Venglovskiy

Titles: Electrophoretic Deposition of Chitosan/Eudragit E 100/Agnps Coatings for Controlled Release of Antibacterial Substance

ICBES 120

Time: 12:35 - 12:50 PM

Presenter: Łukasz Pawłowski, Gdańsk University of Technology, Poland

Authors: Łukasz Pawłowski, Andrzej Zieliński

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SESSION

BIOMEDICAL SCIENCE AND ENGINEERING II

JULY 31 | 11:50 AM – 01:05 PM | SESSION CHAIR: DR. IREN VALOVA, UNIVERSITY OF MASSACHUSETTS DARTMOUTH, USA

Titles: Investigation on Hemodialysis Membranes Morphology and Human Serum Proteins Depositions Using Synchrotron-based Imaging

ICBES 117

Time: 12:50 - 01:05 PM

Presenter: Amira Abdelrasoul, University of Saskatchewan, Canada

Authors: Amira Abdelrasoul

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MVML PLENARY LECTURE

JULY 31 | 01:25 PM - 02:25 PM | SESSION CHAIR: DR. LUIGI BENEDICENTI, UNIVERSITY OF NEW BRUNSWICK, CANADA



Titles: From Differentiable Reasoning to Self-supervised Embodied Active Learning
[Dr. Ruslan Salakhutdinov, Carnegie Mellon University, USA](#)

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Russ Salakhutdinov is a UPMC Professor of Computer Science in the Department of Machine Learning at CMU. He received his PhD in computer science from the University of Toronto. After spending two post-doctoral years at MIT, he joined the University of Toronto and later moved to CMU. Russ's primary interests lie in deep learning, machine learning, and large-scale optimization. He is an action editor of the Journal of Machine Learning Research, served as a program co-chair for ICML2019, served on the senior programme committee of several top-tier learning conferences including NeurIPS and ICML. He is an Alfred P. Sloan Research Fellow, Microsoft Research Faculty Fellow, Canada Research Chair in Statistical Machine Learning, a recipient of the Early Researcher Award, Google Faculty Award, and Nvidia's Pioneers of AI award.

EEE KEYNOTE LECTURE

JULY 31 | 02:25 PM - 03:10 PM | SESSION CHAIR: DR. LUIGI BENEDICENTI, UNIVERSITY OF NEW BRUNSWICK, CANADA



Titles: A Novel Optical Coherence Tomography for Non-Destructive Characterisation of Electrical-Thermal-Mechanical Deformation of Bonding Wires

Dr. Yao-chun Shen, University of Liverpool, UK

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Prof Yaochun Shen received his PhD degree from Nanjing University in 1992. After that he held various positions at Southeast University (China), Heidelberg University (Germany), Heriot-Watt University (UK), Cambridge University (UK) and TeraView Ltd (UK). Currently he is a Chair Professor at the Department of Electrical Engineering and Electronics, the University of Liverpool, UK. Professor Shen has many year's experiences in the development and application of novel cross-sectional imaging technologies based on terahertz imaging and optical coherence tomography. He has been awarded 7 patents and published 5 book chapters and over 200 conference & journal papers with over 6845 citations and an h-index of 45 (Google Scholar). His current research interests include the development of innovative THz and optical imaging technologies with a focus on the exploitation of their practical real-world applications in industry and healthcare.

SESSION

ELECTRICAL ENGINEERING AND ELECTRONICS II

JULY 31 | 3:15 PM- 4:00 PM | SESSION CHAIR: DR. NURUL CHOWDHURY, UNIVERSITY OF SASKATCHEWAN, CANADA

Titles: Ultra-Wideband Microstrip-Fed Antenna Using Magnetic Loop
EEE 111

Time: 03:15 - 03:30

Presenter: Chun-Long Wang, National Taiwan University of Science and Technology, Taiwan

Authors: Yuan-Chun Lee , Chun-Long Wang

Titles: Effects of Charging Lithium-Ion Cells with Zero Termination Current on the State of Health (SoH) for Energy Storage Systems
EEE 112

Time: 03:30 - 03:45

Presenter: Ali Eren KOK, Erciyes University, Turkey

Authors: Ali Eren KOK , Ibrahim DEVELI

Titles: Design of low impedance standard defined in a four-terminal-pair configuration
EEE 117

Time: 03:45 – 04:00

Presenter: Mohamed OUAMEUR, Laboratoire national de métrologie et d'essais, France

Authors: Mohamed OUAMEUR, François ZIADÉ

SESSION

MACHINE LEARNING AND HUMAN COMPUTER INTERACTION

JULY 31 | 4:05 PM- 04:50 PM | SESSION CHAIR: DR. NURUL CHOWDHURY, UNIVERSITY OF SASKATCHEWAN, CANADA

Titles: Reinforcement Learning for Production Planning with Demand Sensitive to Delivery Lead Time

CIST 109

Time: 04:05 - 04:20

Presenter: Chi-Yang Tsai, Yuan Ze University, Taiwan

Authors: Chi-Yang Tsai, Erickson Liang

Titles: New Object Tracker Based On Adaptive Intensity Models of Object and Its Surroundings

MVML 101

Time: 04:20 - 04:35

Presenter: Dorothy Gors, Flanders Make, Belgium

Authors: Dorothy Gors, Robbert Hofman, Merwan Birem, Steven Kauffmann

Titles: Aerial Display Using Lenticular Lenses

MHCI 301

Time: 04:35 - 04:50

Presenter: Kazuhisa Yanaka, Kanagawa Institute of Technology , Japan

Authors: Kazuhisa Yanaka, Kouki Shibata, Toshiaki Yamanouchi