Plenary Speaker 1: Professor Kaoru Sumi (Future University Hakodate, Japan)

Title: Human to Human Interaction using Virtual Agents Posing as Another Person





Kaoru Sumi, Ph.D. Professor, Future University Hakodate, Japan.

Education: Ph.D. from The University of Tokyo

Employment:

Kaoru Sumi is a Professor at Future University Hakodate for 11 years. She is currently working on the following research.

- Human Agent Interaction · Persuasive technology · Affective Computing
- Artificial Intelligence in Education · Digital storytelling

She previously worked at ATR MI&C Research Laboratories, Communications Research Laboratory, and Osaka University, where she researched human-computer interaction, knowledge engineering, and the application of artificial intelligence. After Prof. Sumi worked on media informatics and human-agent interaction at the National Institute of Information and Communications Technology (NICT), and Hitotsubashi University, she worked at The University of British Columbia as a Visiting Professor.

ACM Senior Member, IEEE Senior Member.

Awards:

- Best Technical Paper Award, 27th International Conference on Computers in Education, ICCE2020 (2020.11)
- Best Full Paper Award, 15th International Conference on Intelligent Tutoring Systems, ITS2019 (2019.6)
- IEEE Brain Winner, Brain-Computer Interface Hackathon at IEEE SMC2018 (2018.10)

Abstract:

There have been ever expanding opportunities for online distance education in recent years, and agent-based interactions in virtual spaces have been attracting attention in this context. In this talk, I will discuss the various educational possibilities of using virtual spaces and agents, presenting examples from several studies. I will also introduce our own development of systems using game-based learning [1] and a game-based story generation system that automatically generates scripts in real time on the basis of players' emotions and actions [2]. I will discuss persuasive technology that systems can utilize to influence human behavior, along with impressions and applications of facial expressions and gestures, which are expressions of agents [3], and what can happen when a virtual agent interacts with other users in a virtual space.

[1] Kaoru Sumi and Kodai Kasai: A Serious Game for Learning Social Networking Literacy by Flaming Experiences, Lecture Notes in Computer Science, Volume 178, Social Informatics and Telecommunications Engineering series, Springer (2016.05).

[2] Kaoru Sumi & Shusuke Sato: Experiences of Game-Based Learning and Reviewing History of the Experience Using Player's Emotions, Frontiers in Artificial Intelligence (2022).

[3] Kaoru Sumi and Mizue Nagata: Evaluating a Virtual Agent as Persuasive Technology, Psychology of Persuasion, Janos Csapó and Andor Magyar eds., Nova Science Publishers (2010).

Plenary Speaker 2: Professor Evgeni Magid (Kazan Federal University, Russia) Title: Simulation Tools for Urban Search and Rescue Robotics





Evgeni Magid, PhD, Professor of Kazan Federal University, Russia Senior IEEE member.

Education: Undergraduate Education: 2002, B.Sc. in Mathematics and Computer Science, Technion - Israel Institute of Technology, Israel.

Graduate Education: 2006,

M.Sc. in Applied Mathematics, Technion - Israel Institute of Technology, Israel.

Post Graduate Education: 2011, PhD in Engineering, Doctoral program in Intelligent Interaction Technologies, Graduate School of Systems and Information Engineering at University of Tsukuba, Japan.

Degree: 2011, The University of Tsukuba, Japan, PhD.

Biography:

2016-present: Professor of Kazan Federal University, Institute of Information Technology and Intelligent Systems, Intelligent Robotics Department, Kazan, Republic of Tatarstan, Russia. Head of Intelligent Robotics Department, Founder and Head of «Intelligent Robotic Systems Laboratory», Founder and Director of Master Program in Robotics.

2021-present: Professor, School of Electronic Engineering, HSE Tikhonov Moscow Institute of Electronics and Mathematics, HSE University, Moscow, Russia.

2021-2022: Professor, The Bauman Moscow State Technical University (BMSTU), Moscow, Russia.

2014-2016: Professor, Founder and Head of «Intelligent Robotic Systems Laboratory», Innopolis University, Innopolis city, Republic of Tatarstan, Russia.

2013-2014: Postdoctoral Research Associate, The Bristol Robotics Laboratory, The University of Bristol, Bristol, The United Kingdom (UK).

2012-2013: Postdoctoral Research Fellow, Carnegie Mellon University, Robotics Institute, Pittsburgh, PA, The United States of America (USA).

2011-2012: Postdoctoral Research Fellow, University of Tsukuba, Tsukuba, Japan.

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Abstract:

Real world experiments are critical for validating performance of new concepts and algorithms in robotics field. Yet, experiments tend to be too expensive in terms of time and resources of a research team. Moreover, it is not feasible to conduct thousands of complex experiments with a physical robot in a real environment. To check new ideas, preliminary evaluate new algorithms and interaction protocols, on first stages of a research project it is reasonable to start within a simulation. To produce relevant results, a simulator should provide adequate models of robots and environments with realistic physical properties. This paper presents an overview of our experience in using robot operating system (ROS) with Gazebo and Webots simulators for urban search and rescue robotics projects and considers constructing new models of mobile robots and complicated environments, algorithm validation and comparative analysis.

Keywords: Robotics, modelling, simulation, USAR, ROS, Gazebo, Webots



Plenary Speaker 3 Professor Xiaoyan Chen (Tianjin university of Science and Technology, Tianjin, China)

Title: Enhancement methodology for low light image





Xiaoyan Chen, PhD, Professor of Tianjin university of Science and Technology, Tianjin, China)

Education:

2009 year PH.D of Control Science and Engineering(Tianjin University)
Employment:
1999-2002 : Engineer, Tianjin Hi-Tech Co. Tianjin, China
2002-present: Professor of Tianjin University of Science and Technology, Tianjin, China
2009-2015: Post-doctor (Tianjin University, China)
2009.8-2010.2, visiting scholar of RPI, USA
2012.9-2012.12, visiting scholar of Kent, UK

Awards:

Excellent Advisor of Tianjin Education Committee, 2019. Model Worker Award by Tianjin Government, 2020. Principal Investigator of Softsz Co.,2020-present. Bronze medal of 7th Internet+ Competition of China,2021

Abstract:

In order to solve the problems such as low brightness, high noise and poor contrast in under illumination images, there are several methods proposed to address this issue. Usually, these methods are categorized into two different ways. One is based on traditional lightbased technology, the other is based on machine learning technology. The low-light image enhancement is often a challenging task because the noises in dark areas are amplified with the overall brightness and contrast of the image. With the development of machine learning techniques, deep learning networks are becoming the popular research topics recently to overcome the disadvantages of noisy dots. Based on the deep analysis of the current research work, we proposed a novel network and carried out lots of comparison experiments to analysis the performances of these methods. By training, validation and testing on the datasets, the evaluation critics are defined and utilized to analysis the efficiency of the methods. With the results, we draw the conclusion that the efficient low-light image method can make up for the shortcomings of the environment, bring better viewers' experience and provide preprocessing for subsequent high-level computer vision tasks, such as target recognition, face recognition, semantic segmentation, etc.



Plenary Speaker 4 Mr. Masato Nakagawa (DENSO CORPORATION, Fellow (1980 to present), Tokyo, Japan)

Title: "A New Style of Research and Development from the EU Perspective" Sub-title "An Efficient and Rational R&D Approach"





President and CEO of DENSO Europe in 2015

Education:

B.E. Hiroshima University, Mechanical Engineering **Employment:** DENSO CORPORATION: Fellow (1980 to present) Japan Science and Technology Agency (JST) : Senior Fellow (2020 to present) During the service at DENSO, Masato Nakagawa worked

During the service at DENSO, Masato Nakagawa worked for DENSO European organization consecutive 14 years in the area of Automotive Engineering Field. He was a President and CEO of DENSO Europe in 2015.

Abstract:

This paper introduces a new style of research and development with a unique process of engineering development based on the EU perspective. Two different fields will be separated in the new style: competition field and non-competition field. The former is a specific area encouraging companies to develop their unique technology differentiation strategy, and the later stresses as collaborations among different companies and organizations for spreading the standardization of common technologies. This new style with two different fields shows us a new direction of the engineering development in various engineering industry. In addition, this paper explains robot technologies in the manufacturing of automotive sector in terms of smart manufacturing concept.

