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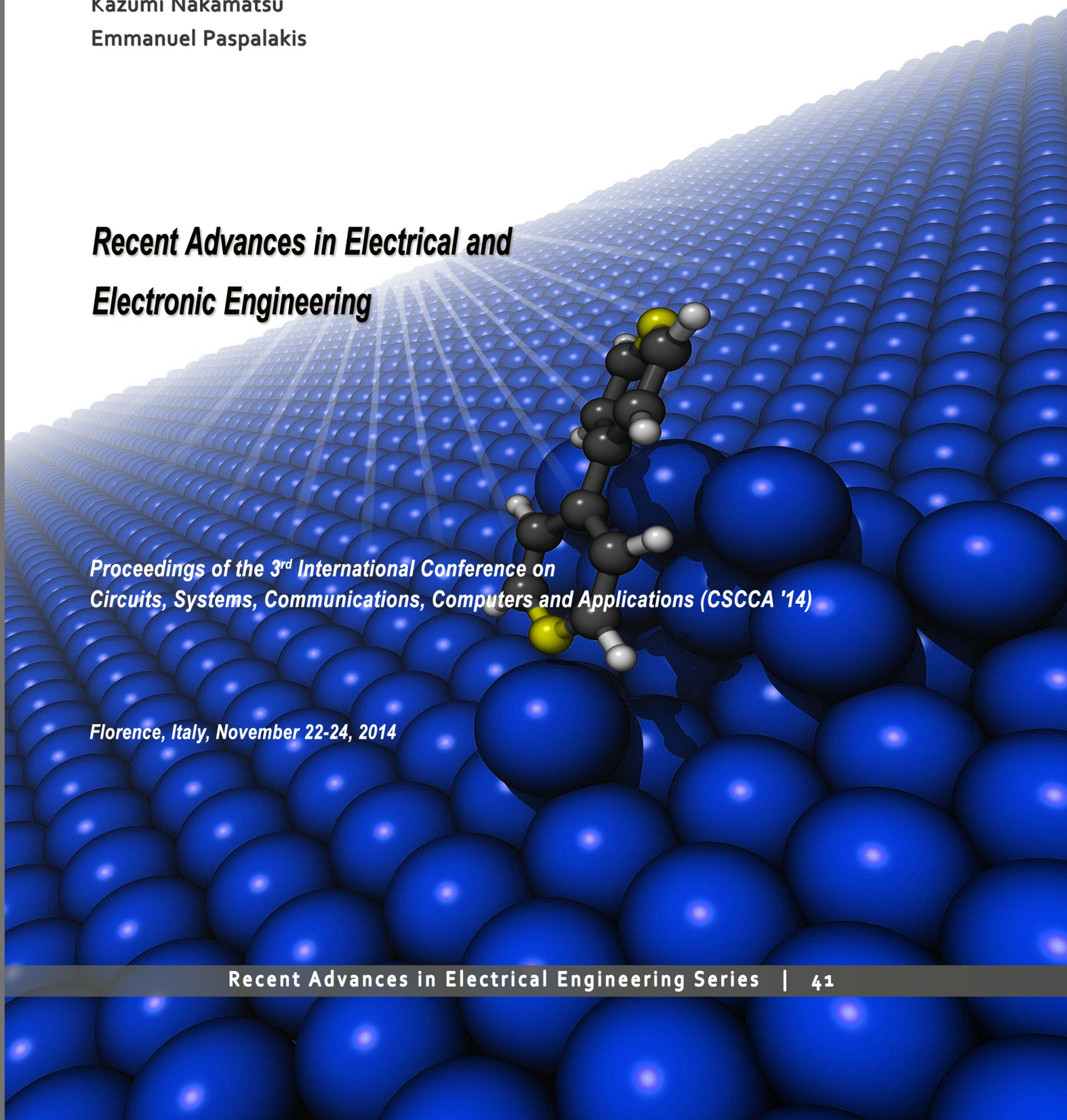
Recent Advances in Electrical and Electronic Engineering



Proceedings of the 3rd International Conference on Circuits, Systems, Communications, Computers and Applications (CSCCA '14)

Florence, Italy, November 22-24, 2014

Recent Advances in Electrical Engineering Series | 41

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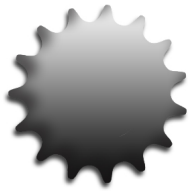

RECENT ADVANCES in ELECTRICAL and ELECTRONIC ENGINEERING

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Plenary Lecture 1

Application of Paraconsistent Annotated Logic Program EVALPSN to Intelligent Control/Safety Verification

Professor Kazumi Nakamatsu
School of Human Science and Environment
University of Hyogo
JAPAN
E-mail: nakamatu@shse.u-hyogo.ac.jp

Abstract: Paraconsistent logic is well known as a formal logic that can deal with contradiction in the framework of logical system consistently. One of paraconsistent logics called annotated logic has been proposed by Prof. Newton da Costa, and its logic program has also been proposed by Prof. V.S. Subrahmanian et al. later as a tool of dealing with knowledge bases.
Some paraconsistent annotated logic programs with strong negation have been developed for dealing with non-monotonic reasoning such as default reasoning, defeasible reasoning, defeasible deontic reasoning, plausible reasoning, etc. by Kazumi Nakamatsu. Recently He has proposed a paraconsistent annotated logic program called Extended Vector Annotated Logic Program with Strong Negation (EVALPSN), which can deal with conflict resolving, defensible deontic reasoning, plausible reasoning, etc. The EVALPSN reasoning function has been applied to various intelligent controls and safety verification systems such as pipeline valve control, traffic signal control, railway interlocking safety verification, etc. In this lecture, some of these applications of EVALPSN with some simulation systems will be introduced.
Moreover, a special EVALPSN that can deal with before-after relations between processes (time intervals), which has been named bf(before-after) –EVALPSN has been developed. It has been shown that bf-EVALPSN can be applied to real-time process order control. It will also be introduced how to apply bf-EVALPSN to intelligent real-time process order control and safety verification with examples.

Brief Biography of the Speaker: Kazumi Nakamatsu received the Ms. Eng. and Dr. Sci. from Shizuoka University and Kyushu University, Japan, respectively. He is a full Professor at School of Human Science and Environment, University of Hyogo, Japan.
His research interests encompass various kinds of logic and their applications to Computer Science, especially paraconsistent annotated logic programs and their applications. He has developed some paraconsistent annotated logic programs called ALPSN(Annotated Logic Program with Strong Negation), VALPSN(Vector ALPSN), EVALPSN(Extended VALPSN) and bf-EVALPSN (before-after EVALPSN) recently, and applied them to various intelligent systems such as a safety verification based railway interlocking control system and process order control. He is an author of over 150 papers and book chapters, and edited 7 books published by prominent publishers.
Kazumi Nakamatsu has chaired various international conferences, workshops and invited sessions, and he has been a member of numerous international program committees of workshops and conferences in the area of Artificial Intelligence and Computer Science. He serves as Editor-in-Chief of the International Journal of Reasoning-based Intelligent Systems by Inderscience Publishers(UK) and an editorial board member of many international journals. He has contributed numerous invited lectures at international workshops, conferences, and academic organizations. He also is a recipient of some conference and paper awards. He is a member of Japan AI Society, IEEE, etc.

Plenary Lecture 2

Coherent Optical Effects of Quantum - Plasmonic Nanocomposites

Associate Professor Emmanuel Paspalakis
co-authors: Efthymios Kallos, Vassilios Yannopapas
Materials Science Department
University of Patras
Greece
E-mail: paspalak@upatras.gr

Abstract: In recent years there is increasing interest in the study of hybrid nanophotonic structures (nanocomposites) that are composed by coupling quantum emitters to plasmonic nanostructures. Examples of these structures are atoms, molecules and quantum dots that are coupled to metallic nanostructures. These hybrid nanostructures may have significantly enhanced optical response in comparison to their constituents. The large fields and the strong light confinement associated with the plasmonic resonances enable strong interaction between the electromagnetic field and the quantum emitters near plasmonic nanostructures. In addition, using the quantum emitter one may achieve external control to the optical properties of the nanocomposite. In this plenary talk, we present new theoretical results on the optical properties of quantum-plasmonic nanocomposites. In our study, we consider both simple and more complex plasmonic nanostructures, including plasmonic metamaterials. The reported results include strong modification of optical absorption and dispersion, creation of controllable slow light, as well as strong enhancement of optical nonlinearities and dipole-forbidden transitions.
Acknowledgements: This work was implemented within the framework of the Action “Supporting Postdoctoral Researchers” of the Operational Program “Education and Lifelong Learning” (Action’s Beneficiary: General Secretariat for Research and Technology), and was co-financed by the European Social Fund and the Greek State (Program Nanokallos PE3_26).

Brief Biography of the Speaker: Emmanuel Paspalakis is Associate Professor at the Materials Science Department of the University of Patras. Dr. Paspalakis obtained his PhD, under the supervision of Professor Sir Peter L. Knight FRS, from the Physics Department of Imperial College London in 1999. At the same Department he worked as a postdoctoral researcher in 1999 (6 months) and 2001 (7 months). In 11/2001 he joined the Materials Science Department of the University of Patras. His research interests cover a wide area of theoretical subjects in various areas of light-matter/material interactions. In the last few years he studies these effects mainly in semiconductor quantum wells and semiconductor quantum dots, but also in other nanostructures, such as quantum and plasmonic nanostructures complexes. Dr. Paspalakis has published 112 papers in international refereed research journals and 20 papers in extended conference proceedings and books that have obtained more than 3700 citations (h-index 32). In addition, he has more than 120 presentations in international and national scientific conferences. Dr. Paspalakis is co-editor of a book entitled “Recent Research Topics and Developments in Chemical Physics: From Quantum Scale to Macroscale”, (Transworld Research Network, 2009) and of three special issues in international scientific journals: “Quantum Control of Matter and Light”, Journal of Modern Optics (2009), “Slow Light”, Journal of Optics (2010) and “Emerging Trends and Novel Materials in Photonics”, Photonics and Nanostructures: Fundamentals and Applications (2011). He is also associate editor of Vol. 1288 of AIP Conference Proceedings. Dr. Paspalakis is a member of the Editorial Boards of the Journal of Modern Optics, the Journal of Advanced Physics, the Journal of Photonics and Optoelectronics, the Journal of Materials, and Annals of Materials Science and Engineering. He has co-organized the International Symposium on Quantum Control and Light-Matter Interactions: Recent Computational and Theoretical Results in Corfu, Greece, in 2007. He was also scientific secretariat in the International Commission of Optics (ICO) Topical Meeting on Emerging Trends and Novel Materials in Photonics that was held in Delphi, Greece, in 2009. He has been a member of 15 European and Greek research projects (in 6 of them as project leader) and was national representative in EC COST project P11 entitled “Physics of linear, nonlinear and active photonic band gap materials”.
http://www.matersci.upatras.gr/en/Paspalakis
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