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Edited by

Cornelia Aida Bulucea
Nikos Mastorakis
Peter Revesz
Panos M. Pardalos
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Plenary Lecture 1

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

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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.