Invited talker:

Associate Professor
Ivan Tanev

IT1 XML-based genetic programming framework: Design philosophy, implementation and applications

Ivan Tanev and Katsunori Shimohara
(Doshisha University, Japan)

We present the design philosophy, the implementation and various applications of XML-based genetic programming (GP) framework (XGP). The key feature of XGP is the distinct representation of genetic programs as DOM-parse trees featuring corresponding flat XML-text. XGP contributes to the achievement of (i) fast prototyping of GP by using the standard built-in API of DOM-parsers for manipulating the genetic programs, (ii) human-readability and modifiability of the genetic representations (iii) generic support for the representation of grammar of strongly-typed GP using W3C-standardized XML-schema; and (iv) inherent inter-machine migratability of the text-based genetic representation (i.e., the XML text) in the distributed implementations of GP.

Education:
- In 1987, M.S. degree in Computer Engineering (with honors) from Leningrad Institute of Electrical Engineering, Leningrad, Soviet Union
- In 1993, Ph.D. in Computer Engineering from Saint Petersburg State University of Electrical Engineering, Saint Petersburg, Russia
- In 2001, Dr.Eng in Computer Science and System Engineering from Muroran Institute of Technology, Muroran, Japan

Professional Training and Employment:
- 1987, Researcher, Space Research Institute, Bulgarian Academy of Sciences, Bulgaria
- 1988-1989, Researcher, Central Institute of Computer Engineering and Technology, Bulgaria
- 1994-1997, System Administrator, National Electricity Company, Bulgaria
- 2001-2002, Software Developer, Synthetic Planning Industry Co.Ltd., Japan
- 2002-2004, Senior Researcher, ATR Human Information Science Laboratories, Japan
- 2004-2006, Lecturer, Department of Information Systems Design, Doshisha University, Japan
- 2006-present, Associate Professor, Department of Information Systems Design, Doshisha University, Japan

IT2 Brain's doing in its resting-state: Default mode network as an inside story within the brain

Jian-Qin Liu[1] and Katsunori Shimohara[2]

([1]NICT, KARC, Japan)
([2]Doshisha University, Japan)

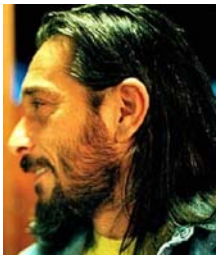
Expert-Researcher
Jian-Qin Liu

As a promising research field after the turn of the new century, *Default Mode Network* (abbreviated as DMN) of the brain shows the strong potential of a new breakthrough to neuroscience, which emphasizes the baseline of the brain's activities when brain is awake but without any external input signal to it. This study is highlighted recently and expected to provide keys to understanding the mental disorders such as Alzheimer's disease. This paper consists of following two sections. (1) A brief tutorial on the DMN is presented with necessary fundamental knowledge of neuroscience on brain. (2) A framework of network informatics for DMN is proposed based on network dynamics; models of information networks are discussed by bridging the gap between the level of regions and the level of neurons of the brain; major issues on analyzing the DMN by brain imaging technology are discussed as well. In a word, one of the inspirations from DMN is how spontaneous collective behavior is emerged within an autonomous system, which is crucial to systematically understand the brain's function and exploring new design principles of autonomous robotics to demonstrate complex life-like behaviors in engineering.

Education:
- In 1986, B.S. in Computer and Systems Science from Nankai University, China
- In 1992, M.S. in Automation Theory and Applications from Xi'an Jiaotong University, China
- In 1997, Ph.D. in Industrial Automation from Central South University of Technology, China
- In 2006, Dr. of Informatics from Kyoto University, Japan

Professional Training and Employment:
- 1986-1991, Assistant Lecturer, Institute of AI and Robotics, Department of Information and Control Engineering, Xi'an Jiaotong University
- 1992-1994, Lecturer, Institute of AI and Robotics, Department of Information and Control Engineering, Xi'an Jiaotong University
- 1994.09-1995.09, Guest Researcher, Information and Communication R & D Center, Ricoh Co. Ltd., Japan
- 1995-1999, Associate Professor, College of Information Engineering, Central South University of Technology
- 2000, Certificate of Professor, College of Information Engineering, Central South University
- 1999-2003.03, Researcher, Advanced Telecommunications Research Institute International (ATR), Japan
- 2003.04-2006.03, Senior Researcher, Advanced Telecommunications Research Institute International (ATR), Japan
- 2006.04-present, Expert Researcher, Kobe Advanced ICT Research Center (KARC), National Institute of Information and Communications Technology (NICT), Japan

IT3 Wearing the playware



Professor
Luigi Pagliarini

Luigi Pagliarini[1,2] and Henrik Hautop Lund[1]

([1]Technical University of Denmark, Denmark)
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In this conceptual paper, we describe and define the range of possible applications and the technical contours of a robotic system to be worn on the body for playful interactions. Earlier work on Modular Robotic Wearable, MRW, described how, by using modular robotics for creating wearable, it is possible to obtain a flexible wearable processing system, where freely inter-changeable input/output modules can be positioned on the body suit in accordance with the task at hand. Here, we drive the attention on early prototypes to show the potentialities of such an approach, and focus on depicting possible application in the electronic games domain. Indeed, the Modular Robotic Wearable is an example of modular playware, which can create playful interactions for many application domains, including electronic games.

Education:
- Master Degree in Experimental Neuropsychology

Professional Training and Employment:
An Artist, Art Curator, Psychologist, Multimedia and Software Designer, and a worldwide known as a theoretician and expert in (mainly Artistic) Robotics, A.I. and Artificial Life.
- Professor, Theories of Perception and Psychology of Shape and of Computer Art, the Academy of Fine Arts of Bari, Italy
- Associate Professor, Center for Payware, Technical University of Denmark
- Founder and Director, the Pescara Electronic Artists Meeting
- President, the Cultural Association Artificialia
- Art Director, Ecoteca
- Founder of RoboCup Junior and Member of its International Committee