This issue of IJSSCI presents a special issue on Cognitive Foundations of Software Engineering co-edited by Prof. Shushma Patel and Dr. Yusheng Tian, which covers the latest developments in software science and software engineering. The cognitive foundations of software engineering are an important area of basic research in software engineering in order to explain the nature, fundamental properties, and laws that constrain software and software engineering technologies. The subjects under studying in this area include key issues such as the nature and properties of software, metaphors on software, constraints on software engineering, as well as the cognitive, mathematical, computing, informatics, linguistic, and intelligent behavioral laws of software and their applications in software engineering.


The EiC would like to report that the 7th IEEE International Conference on Cognitive Informatics (ICCI’08) has been successfully held at Stanford University, California during August 14 – 16, 2008. The EiC is delighted to report that IJSSCI has been indexed in DBLP, PsycINFO, CSA Illumina, and Google Scholar. IJSSCI has been well recognized in the fields of computing, cognitive informatics, artificial intelligence, and computational intelligence.

The EiC expects that readers of IJSSCI will benefit from the papers presented in this issue in order to aware the latest advances and progresses in software science and computational intelligence. I would like to thank authors and reviewers of this issue. I would like to acknowledge the publisher of IJSSCI, the IGI Publishing, USA, and to thank Mehdi Khosrow-Pour (President of IGI), Jan Travers (Managing Director), and editors of IGI, Jennifer Neidig, Heather Probst, and Elizabeth Duke, for their excellent professional support.
This special issue on the Cognitive Foundations of Software Engineering is long overdue and takes a philosophical view of software science and engineering in that software is not constrained by physical laws. Therefore, the cognitive exploration of the foundations of software and software engineering is crucially important. In his 2007 book entitled “Software Engineering Foundations: A software Science Perspective,” Professor Yingxu Wang identified three categories of fundamental constraints for software engineering known as the cognitive, managerial, and resource constraints. This issue will help to understand the nature of software and its mathematical, informatics, cognitive, systematic, and intelligent behavioral properties and thus the basis that software engineering is founded on solid theoretical foundations. New methodologies and novel mathematical means known as denotational mathematics may be discovered or created for software behavior description, programming psychology, program comprehension, and efficient transformation of skills and experiences in software engineering.

This special issue on Cognitive Foundations of Software Engineering in IJSSCI focuses on current trends and the latest research that explores the cognitive and informatics nature of software, the properties of software in the aspects of cognitive complexity, instructive information, and intelligent behaviors. This issue has attracted papers from leading researchers in the field of software engineering and cognitive informatics and as a result seven papers are accepted as follows:


2. Jones’ paper on “Positive and Negative Innovation in Software Engineering” looks at how innovations in the software arena can be divided into product innovations and process innovations. Within these two facets, they can be evaluated as positive and negative and will elicit debate in what the perception of positive and negative are, in terms of benefits and loss, for software engineers.

3. In his paper entitled “On the Cognitive Complexity of Software and its Quantification and Formal Measurement,” Wang discovered that the cognitive complexity of software is a product of its architectural and operational complexities, based on the deductive semantics and abstract system
For a solid theoretical foundation, the nature of software functional complexities in software engineering is explicated. Guéhéneuc proposes a theory that combines vision science and program comprehension to provide a holistic, cognitive approach to understanding program comprehension activity for expert and novice software engineers. Mahalakshmi and Geetha present a paper on “Requirements Elicitation by Defect Elimination: An Indian Logic Perspective,” which provides an interesting insight into the differences between Western and Indian Logic and introduces an Indian logic-based methodology for requirements. Misra’s paper, “Measurement of Cognitive Functional Sizes of Software,” focuses on cognitive aspects of measurement theory and validation of software complexity in order to define empirical approaches for software measurement, which also describes applications of Wang’s cognitive complexity theory in software engineering.

Mariappanadar proposes a motivational gratification model for employees to support design applications and suggests that they can help reduce complexity in the design stages.

The guest editors would like to thank all authors and reviewers of this special issue for their great contributions. We would like to thank the support of the Editor-in-Chief of IJSSCI, Professor Yingxu Wang, and his seminal work on cognitive foundations of software engineering. We would like to acknowledge the publisher of IJSSCI, IGI Publishing, and editors for their professional work.