

JCKBSE 2020

August 24-26, 2020



DETAILED CONFERENCE PROGRAM

13th International Joint Conference on Knowledge- Based Software Engineering

**DEPARTMENT OF INFORMATICS, UNIVERSITY OF
PIRAEUS, GREECE**

**GRADUATE SCHOOL OF INFORMATION SCIENCE
AND TECHNOLOGY, OSAKA UNIVERSITY, JAPAN**

JCKBSE2020 CHAIRS' MESSAGE



Welcome to the 2020 International Joint Conference on Knowledge-based Software Systems (JCKBSE2020).

This booklet summarizes the works and new research results presented at the **13th International Joint Conference on Knowledge-based Software Engineering (JCKBSE2020)**. JCKBSE2020 was originally planned to take place in Larnaca, Cyprus. Unfortunately, the COVID-19 pandemic forced it to be rescheduled as an online conference. JCKBSE is a well-established international biennial conference that focuses on the applications of Artificial Intelligence on Software Engineering. The 13th International Joint Conference on Knowledge-based Software Engineering (JCKBSE2020) was organized by the Department of Informatics of the University of Piraeus, Greece and the Graduate School of Information Science and Technology of Osaka University, Japan.

This year, pretty much like every year, the majority of submissions originated from Japan, while Greece was second. The submitted papers were rigorously reviewed. Finally, 15 papers were accepted for presentation at JCKBSE2020 and inclusion in its Proceedings. The papers accepted for presentation in JCKBSE2020 address topics such as the following:

- Architecture of knowledge-based systems, intelligent agents and softbots
- Architectures for knowledge-based shells
- Automating software design and synthesis
- Decision support methods for software engineering
- Development of multi-modal interfaces
- Development of user models
- Development processes for knowledge-based applications
- Empirical /evaluation studies for knowledge-based applications
- Intelligent user interfaces and human-machine interaction
- Internet-based interactive applications
- Knowledge acquisition
- Knowledge engineering for process management and project management
- Knowledge management for business processes, workflows and enterprise modeling
- Knowledge technologies for semantic web
- Knowledge technologies for service-oriented systems, Internet of services and Internet of things
- Knowledge technologies for web services
- Knowledge-based methods and tools for software engineering education
- Knowledge-based methods and tools for testing, verification and validation, maintenance and evolution
- Knowledge-based methods for software metrics
- Knowledge-based requirements engineering, domain analysis and modeling
- Methodology and tools for knowledge discovery and data mining
- Ontologies and patterns in UML modeling
- Ontology engineering
- Program understanding, programming knowledge, modeling programs and programmers

- Software engineering methods for Intelligent Tutoring Systems
- Software life cycle of intelligent interactive systems
- Software tools assisting the development

In addition to technical paper presenters, in JCKBSE2020 we had the following distinguished researchers as keynote speakers:

1. Prof.-Dr. Nikolaos G. Bourbakis, Wright State University, USA
2. Prof.-Dr. Haruhiko Kaiya, Kanagawa University, Japan

We would like to thank **Prof.-Dr. Shuichihiro Yamamoto** and **Prof.-Dr. Lakhmi C. Jain** for acting as **Honorary Chairs of JCKBSE2020**.

We also would like to thank the authors for choosing JCKBSE2020 as the forum for presenting the results of their research. Additionally, we would like to thank the reviewers for taking the time to review the submitted papers rigorously. For putting together the website of JCKBSE2020 and for managing the conference administration system and coordinating JCKBSE2020, we would like to thank **Easy Conferences Ltd., Nicosia, Cyprus**. Finally, we would like to thank the **Springer personnel** for their wonderful job in producing the JCKBSE2020 proceedings, which are available at <https://www.springer.com/gp/book/9783030539481>.

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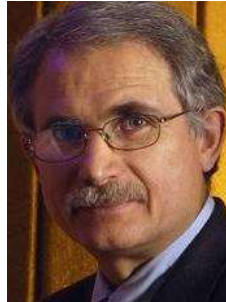
Hironori Washizaki, Waseda University / NII / SYSTEM INFORMATION / eXmotion, Japan

PROGRAM AT A GLANCE

TIME	TUESDAY 25 AUGUST 2020
10:45-11:00	OPENING SESSION
11:00-12:20	S-1
12:20-12:30	<i>BREAK</i>
12:30-13:50	S-2
13:50-14:00	<i>BREAK</i>
14:00-14:50	KEYNOTE-1
TIME	WEDNESDAY 26 AUGUST 2020
11:00-11:50	KEYNOTE-2
11:50-12:00	<i>BREAK</i>
12:00-13:20	S-3
13:20-13:30	<i>BREAK</i>
13:30-14:30	S-4
14:30-14:45	CLOSING SESSION

INVITED KEYNOTE SPEAKERS

Tuesday, 25 August 2020, 14:00-14:50



Nikolaos G. Bourbakis, IEEE Fellow, Distinguished Professor of Information & Technology and Director of the Center of Assistive Research Technologies (CART), Wright State University, USA

Title: A SPN Holistic Approach for Automatic Deep Understanding of Technical Documents

Abstract:

For many decades, scientists and practitioners are developing methodologies for solving simple and complex scientific problems. Lately, they are creating synergies of different methodologies in order to solve these complex problems, but they have to face issues of compatibility among the different modalities that compose these scientific problems. One of these complex problems is the deep processing and understanding of technical documents, which are composed of different modalities, like natural language text, system diagrams, math formulas, algorithms, tables, graphics, pictures, etc. Humans have the ability to understand, process and associate these modalities to significantly contribute to the overall deeper understanding of the technical document and the knowledge represented in it.

Thus, this talk offers a possible solution to these multimodal complex problems by expressing all the modalities into the same medium (in this case the Stochastic Petri-nets (SPN) model) for a synergistic and automatic deep understanding of technical documents (TDs). Specifically, all the modalities are expressed into Natural Language Sentences and into SPN models for better associations and deeper understanding.

Short bio:

Prof. Nikolaos Bourbakis (IEEE Life Fellow) currently is a Distinguished Professor of Information & Technology and the Director of the Center of Assistive Research Technologies (CART) at Wright State University, OH. He is the Founder and the EIC of three International Journals (Artificial Intelligence Tools (World Scientific Publ.), Monitoring and Surveillance Tech Research (IGI-Global, Publ.), and Bioengineering & Bioinformatics (EAI Transactions)) the Founder and the Steering Committee Chair of several International IEEE Computer Society Conferences (ICTAI, BIBE, IISA), Symposia and Workshops. He pursues research in Assistive Technologies, Applied Artificial Intelligence, Bioengineering, Information Security, and Distributed Processing funded by USA and European government and industry. He has extensively published in IEEE and International Journals and Conferences, and he has graduated several dozens of PhD students. His research work has been internationally recognized and won several prestigious awards in IEEE, Universities and Societies.

Wednesday, 26 August 2020, 11:00-11:50



Haruhiko Kaiya, Professor, Kanagawa University, Japan

Title: AI Quantitative Analysis of Goal Oriented Requirements Models

Abstract:

An information system is developed and embedded into a daily activity, in order to satisfy requirements of people in the activity. Because the system is expected to improve the activity, we have to predict the extent of such improvement. Goal oriented requirements models are useful to represent the relationships among systems and people in a business or life activity. We have proposed extended goal oriented requirements models to predict how well the system improves the activity of the people. In this talk, we briefly introduce typical goal oriented requirements models, and their extensions suitable for quantitative analysis. Finally, we show several issues of future challenges.

Short bio:

Haruhiko Kaiya is a Professor in the Faculty of Science, Kanagawa University, Japan. He is interested mainly in requirements engineering especially goal oriented models and ontologies. He was a member of program committee in international requirements engineering conferences (RE) and international conferences on advanced information systems engineering (CAiSE).

TECHNICAL PAPER PRESENTATION SCHEDULE

TUESDAY, AUGUST 25

10:45 - 11:00	Opening Session
11:00 - 12:20	S-1
Session Chair: Hironori Takeuchi	<ul style="list-style-type: none">❖ 11:00-11:20 Taking Programming to the Masses: Revisiting Principles and Challenges in Natural Language Programming <i>Juliano Efon Sales, Andre Freitas, Douglas Oliveira, Adamantios Koumpis, Siegfried Handschuh</i>❖ 11:20-11:40 Improving Accuracy of Automatic Derivation of State Variables and Transitions from a Japanese Requirement Specification <i>Hiroya Ii, Kozo Okano, Shinpei Ogata</i>❖ 11:40-12:00 Supporting Change Management of Sequence Diagrams <i>Atsushi Ohnishi, Takayuki Omori, Toshitaka Odamura</i>❖ 12:00-12:20 Model-Based Testing for MQTT Applications <i>Kotaro Tanabe, Yoshinori Tanabe, Masami Hagiya</i>
12:20 - 12:30	Break
12:30 - 13:50	S-2
Session Chair: Evangelos Sakkopoulos	<ul style="list-style-type: none">❖ 12:30-12:50 A Study of Mechanism Design for C2C Service Based on Multi-Agent Simulation <i>Takuya Izumisawa, Yuki Katsumata, Akira Yamada</i>❖ 12:50-13:10 Experimental Evaluation of Traceability Checking Tool for Goal Dependency Modeling <i>Haruhiko Kaiya, Wataru Fujita, Ryotaro Yamada, Atsuo Hazeyama, Shinpei Ogata, Takao Okubo, Nobukazu Yoshioka, Hironori Washizaki</i>❖ 13:10-13:30 Adaptability Assessment of AI Service Systems <i>Hironori Takeuchi, Yukino Oyama, Kazuki Yamamoto</i>❖ 13:30-13:50 Changes in industry-academia-government collaboration using the regional development process model for information systems <i>Takayuki Kunieda, Satoru Yamada, Yusuke Kometani, Naka Gotoda, Rihito Yaegashi</i>
13:50 - 14:00	Break

14:00 - 14:50

Keynote – 1: Nikolaos G. Bourbakis

WEDNESDAY, AUGUST 26

11:00 - 11:50

Keynote – 2: Haruhiko Kaiya

11:50 - 12:00

Break

12:00 – 13:20

S-3

Session Chair:

- ❖ **12:00-12:20** Identifications of Webpage Layout Patterns based on Lines of Vision

Junko Shirogane, Atsuko Eguchi, Hajime Iwata, Yoshiaki Fukazawa

Shinpei Ogata

- ❖ **12:20-12:40** STAMP S&S: Layered Modeling for the complexed system in the society of AI/IoT

Tomoko Kaneko, Nobukazu Yoshioka

- ❖ **12:40-13:00** Parked Car Detection Method Based on Home Wireless LAN - Using Household Equipment to Detect a Parked Car

Motoko Suzuki, Yuki Katsumata, Akira Yamada

- ❖ **13:00-13:20** Supporting System for Visiting Sightseeing Spot Using Image Recognition and Processing Technology (KadaBingo)

Soma Ishikawa, Ryosuke Izumi, Hiroki Asakimori, Satoru Yamada, Takayuki Kunieda, Yusuke Kometani, Naka Gotoda, Rihito Yaegashi

13:20 – 13:30

Break

13:30 - 14:30

S-4

Session Chair:

Maria Virvou

- ❖ **13:30-13:50 Development of Support System to Activate Learner's Question Behavior with Dummy Learner**
Takumi Shiiki, Tomoki Yabe, Teruhiko UNOKI, Takayuki Kunieda, Yusuke Kometani, Naka Gotoda, Rihito Yaegashi
- ❖ **13:50-14:10 Deploying Personalized Oblivious Mobile Identity**
Evangelos Sakkopoulos, Georgia Sourla
- ❖ **14:10-14:30 How the Apriori Algorithm Can Help to Find Semantic Duplicates in Ontology**
Irina Astrova, Arne Koschel

14:30 – 14:45

Closing Session

Thank you for your participation in JCKBSE2020 which was held online!

We hope to see you again in one of the future conferences in the JCKBSE Series

<https://www.easyconferences.eu/jckbse2020>



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