

JCKBSE 2022

August 22-24, 2022



DETAILED CONFERENCE PROGRAM

14th International Joint Conference on Knowledge- Based Software Engineering

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

JCKBSE2022 CHAIRS' MESSAGE



Welcome to the 2022 International Joint Conference on Knowledge-based Software Systems (JCKBSE2022).

This booklet summarizes the works and new research results presented at the **14th International Joint Conference on Knowledge-based Software Engineering (JCKBSE2022)**. JCKBSE2022 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 14th International Joint Conference on Knowledge-based Software Engineering (JCKBSE2022) was organized by the Department of Informatics of the University of Piraeus, Greece.

This year, pretty much like every year, the majority of submissions originated from Japan, while Greece was second. The submitted papers were rigorously reviewed by at least two independent reviewers. Finally, 16 papers were accepted for presentation at JCKBSE2022 and inclusion in its Proceedings. The papers accepted for presentation in JCKBSE2022 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. **Dr. Haruki Ueno, *National Institute of Informatics, Japan***
2. **Dr. Efthimios Alepis, *University of Piraeus, Greece***

First and foremost, we would like to thank **Prof.-Dr. Shuichihiro Yamamoto, *International Professional University of Technology in Nagoya, Japan*** and **Prof.-Dr. Nikolaos G. Bourbakis, *Wright State University, Ohio, USA*** for acting as **Honorary Chairs of JCKBSE2022**.

We also would like to thank the authors for choosing JCKBSE2022 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 JCKBSE2022 and for managing the conference administration system and coordinating JCKBSE2022, 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 JCKBSE2022 proceedings, which are available via <https://link.springer.com/>.

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PROGRAM AT A GLANCE

TIME	TUESDAY 23 AUGUST 2022
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 24 AUGUST 2022
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>
13:30-14:50	S-4
14:50-15:00	CLOSING SESSION

INVITED KEYNOTE SPEAKERS

Tuesday, 23 August 2022, 14:00-14:50



Dr. Efthimios Alepis, *University of Piraeus, Greece*

Title: Attacks in Android Mobile User Interfaces exposing user's privacy and personal data

Abstract:

This keynote speech presents research in problems that appear in recent mobile OS User Interfaces. Mobile devices are highly dependent on the design of user interfaces, since their size and computational cost introduce considerable constraints. Therefore, both UX and UI are considered as top priorities among major mobile OS platforms. This keynote speech highlights pitfalls in the design of Android UI which can greatly expose users and break user trust in the UI by proving how deceiving it can be in a number of UI attacks.

Short bio:

Dr. Efthimios Alepis is an Associate Professor in the Department of Informatics, University of Piraeus, Greece. He has authored/co-authored more than 180 scientific papers, which have been published in international journals, book chapters and international conferences. He has received several awards by Google and Microsoft for his research in the security of their Operating Systems. Dr. Alepis is the founder of the Greek Company "Software Engineering Innovation Group – SEIG" the activities of which include, among other, production of innovative software and IT services. His current research interests are in the areas of Object-oriented Programming, Mobile Software Engineering, Human-Computer Interaction, Affective Computing and Security in Mobile Applications.

Wednesday, 24 August 2022, 11:00-11:50



Dr. Haruki Ueno, *National Institute of Informatics, Japan*

Title: AI as Dual Use Technology

Abstract:

This keynote speech discusses AI from the point of views of Dual Use Technology (DUT). DUT is a technology with the potential for both peace and military applications, and has increasing role for nations globally. AI is the one of key technologies in DUT. This speech presents the root, history and current trend of AI, DUT and inter-relationship. DUT dilemma is also discussed for national security. The role of government has increased so that nation-level policy, long-range goal, financial support to academia, military and industry should be made based on democratic procedure. In addition, global trend is discussed by reviewing some typical countries.

Short bio:

Dr. Haruki Ueno is Professor Emeritus of National Institute of Informatics, and The Graduate University for Advanced Study (Sokendai), Japan. He received Bachelor of Electric Engineering from National Defense Academy, Ph.D of Electrical Engineering from Tokyo Denki University. His carriers include Research Associate of Institute of Medical Informatics, Missouri University, Professor of Department of Information Science, Graduate School of Tokyo University, Professor of Department of Informatics, National Institute of Informatics and Sokendai. He has authored/co-authored more than 300 scientific publications including international journals, international conferences and national journals, books and book chapters. He proposed the concept and technology of Object Model for advanced knowledge systems and developed knowledge-based systems including program understanding, symbiotic robots, digital system trouble shooting (with IBM), etc. using the model. He is the founder of JCKBSE.

DETAILED TECHNICAL PAPER PRESENTATION SCHEDULE

TUESDAY, AUGUST 23

10:45 - 11:00	Opening Session: M. Virvou, G.A. Tsihrintzis and T. Saruwatari
11:00 - 12:20	S-1
Session Chair: Maria Virvou	<ul style="list-style-type: none">❖ 11:00-11:20 Proposal of middleware to support the development of IoT firmware analysis tools <i>Minami Yoda, Shuji Sakuraba, Yuichi Sei, Yasuyuki Tahara, Akihiko Ohsuga</i>❖ 11:20-11:40 Feature-based Cloud Provisioning for Rehosting <i>Misaki Mito, Takatoshi Ohara, Ryo Shimizu, Hideyuki Kanuka, Minoru Tomisaka</i>❖ 11:40-12:00 Patterns to improve the reusable numerical simulation <i>Junichi Ichimura, Takako Nakatani</i>❖ 12:00-12:20 SpiderTailed: A Tool for Detecting Presentation Failures Using Screenshots and DOM Extraction <i>Takato Okajima, Takafumi Tanaka, Atsuo Hazeyama, Hiroaki Hashiura</i>
12:20 - 12:30	Break
12:30 - 13:50	S-2
Session Chair: Tanabe Yoshinori	<ul style="list-style-type: none">❖ 12:30-12:50 Collecting Insights and Developing Patterns for Machine Learning Projects based on Project Practices <i>Hironori Takeuchi, Kota Imazaki, Noriyoshi Kuno, Takuo Doi, Yosuke Motohashi</i>❖ 12:50-13:10 Supporting code review by a neural network using program images <i>Kazuhiko Ogawa, Takako Nakatani</i>❖ 13:10-13:30 Safety and Risk Analysis and Evaluation Methods for DNN Systems in Automated Driving <i>Tomoko Kaneko, Yuji Takahashi, Shinichi Yamaguchi, Junji Hashimoto, Nobukazu Yoshioka</i>❖ 13:30-13:50 Regulation and Validation Challenges in Artificial Intelligence-empowered Healthcare Applications - The Case of Blood-retrieved Biomarkers <i>Dimitrios Panagoulas, Maria Virvou, George A. Tsihrintzis</i>

13:50 – 14:00

Break

14:00 - 14:50

Keynote – 1: Efthimios Alepis

Session Chair:

George A. Tsihrintzis

WEDNESDAY, AUGUST 24

11:00 - 11:50

Keynote – 2: Haruki Ueno

Session Chair:

Shuichiro Yamamoto

11:50 - 12:00

Break

12:00 – 13:20

S-3

Session Chair:

Takako Nakatani

- ❖ **12:00-12:20 Multi-Agent Simulation for Risk Prediction in Student Projects with Real Clients**
Fumihiko Kumeno
- ❖ **12:20-12:40 Automatic scoring in programming examinations for beginners**
Yoshinori Tanabe, Masami Hagiya
- ❖ **12:40-13:00 A Study on Analyzing Learner Behaviors in State Machine Modeling Using Process Mining and Statistical Test**
Shinpei Ogata, Hiroyuki Nakagawa, Haruhiko Kaiya, Hironori Takeuchi
- ❖ **13:00-13:20 Supporting conveyance of webpages by highlighting text for visually impaired persons**
Daisuke Sayama, Junko Shirogane, Hajime Iwata, Yoshiaki Fukazawa

13:20 – 13:30

Break

13:30 - 14:30

S-4

Session Chair:

Fumihiro Kumeno

- ❖ **13:30-13:50 Comparative Study on Functional Resonance Matrices**
Shuichiro Yamamoto
- ❖ **13:50-14:10 Method for matching patterns based on event semantics with requirements**
Maiko Onishi, Shinpei Ogata, Kozo Okano, Daisuke Bekki
- ❖ **14:10-14:30 Digital SDGs Framework towards Knowledge Integration**
Shuichiro Yamamoto
- ❖ **14:30-14:50 Hierarchical User Review Clustering Based on Multiple Sub-goal Generation**
Shuaicai Ren, Hiroyuki Nakagawa, Tatsuhiro Tsuchiya

14:50 – 15:00

Closing Session: M. Virvou, G.A. Tsihrintzis and T. Saruwatari

Thank you for your participation in JCKBSE2022 which was held online!

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

<https://www.easyconferences.eu/jckbse2022>



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