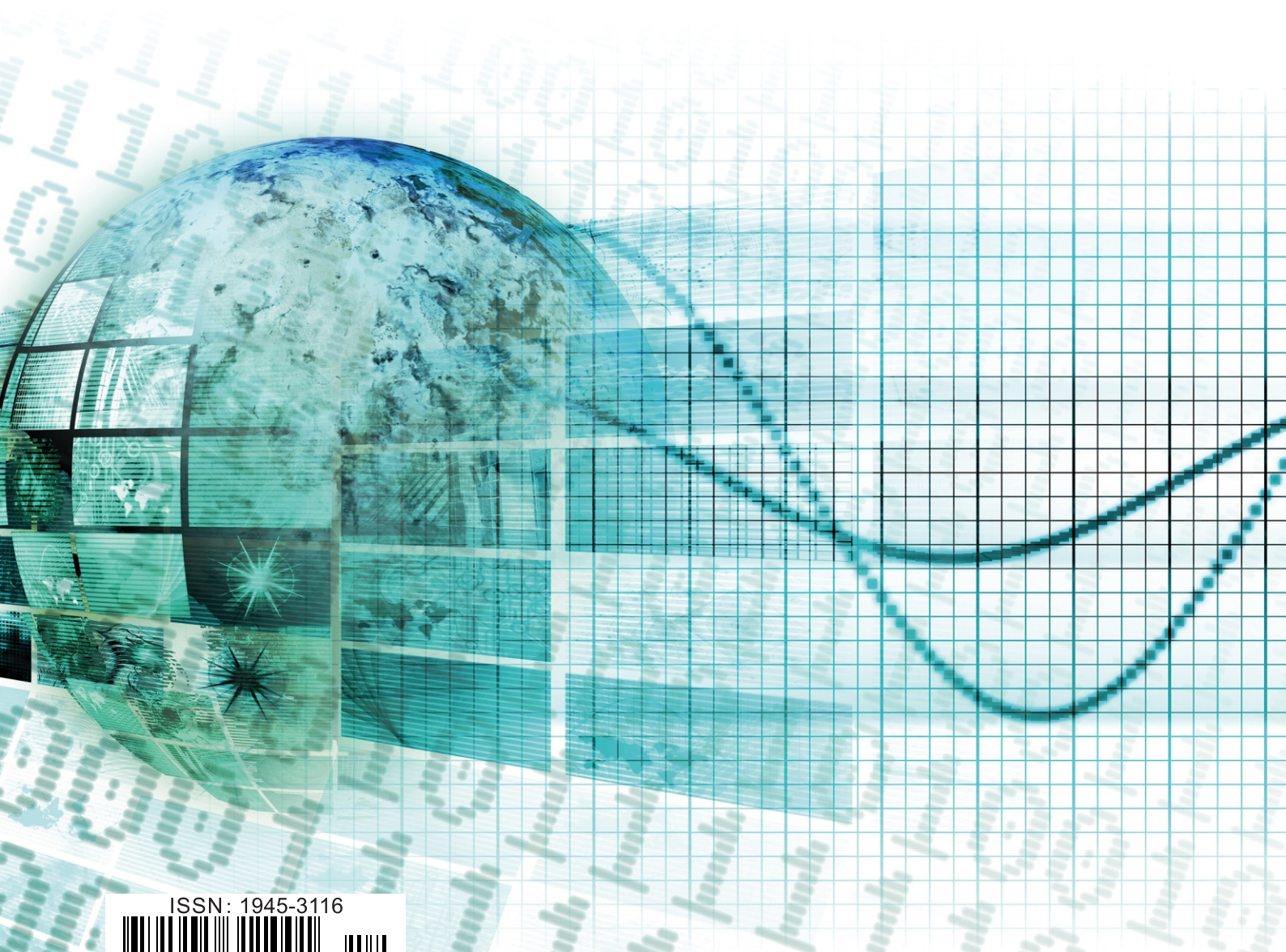


ISSN: 1945-3116

Volume 18, Number 12, December 2025



# Journal of Software Engineering and Applications



ISSN: 1945-3116



<https://www.scirp.org/journal/jsea>

# Journal Editorial Board

ISSN 1945-3116 (print) ISSN 1945-3124 (online)

<https://www.scirp.org/journal/jsea>

---

## Editor-in-Chief

**Prof. Yashwant K. Malaiya**

Colorado State University, USA

## Editorial Board

**Prof. Omar Abu Arqub**

Al-Balqa Applied University, Jordan

**Prof. Philip Achimugu**

Air Force Institute of Technology Kaduna, Nigeria

**Dr. Nicoletta Adamo-Villani**

Purdue University, USA

**Prof. Abbas H. Hassin Alasadi**

University of Basrah, Iraq

**Dr. Omar H. Alhazmi**

Taibah University, Saudi Arabia

**Dr. Shahzad Ashraf**

Hohai University, China

**Prof. Charles W. Butler**

Colorado State University, USA

**Prof. Kuang-Hua Chang**

The University of Oklahoma, USA

**Dr. Calvin Yu-Chian Chen**

China Medical University, China

**Dr. Kim-Kwang Raymond Choo**

University of South Australia, Australia

**Prof. Beata Czarnacka-Chrobot**

Warsaw School of Economics, Poland

**Dr. Christian Dawson**

Loughborough University, UK

**Prof. Steven A. Demurjian**

The University of Connecticut, USA

**Prof. Paolino Di Felice**

University of L'Aquila, Italy

**Prof. Agostino Forestiero**

National Research Council of Italy, Italy

**Dr. Kevin A. Gary**

Arizona State University, USA

**Dr. Phan H. Giang**

George Mason University, USA

**Prof. Yavuz Gunalay**

Bahçeşehir University, Türkiye

**Dr. Nabil Hameurlain**

University of Pau, France

**Prof. Shanmugasundaram Hariharan**

Vardhaman College of Engineering, India

**Dr. Wolfgang Herzner**

Austrian Institute of Technology, Austria

**Prof. Richard T. Hurley**

Trent University, Canada

**Prof. Mike Joy**

University of Warwick, UK

**Dr. Jacky Wai Keung**

City University of Hong Kong, China

**Dr. Mitsuhiro Kimura**

Hosei University, Japan

**Prof. Chang-Hwan Lee**

Dongguk University, South Korea

**Prof. Pascal Lorenz**

University of Haute Alsace, France

**Dr. Mohamed Wiem Mkaouer**

Rochester Institute of Technology, USA

**Prof. Nageswara Rao Moparthy**

K L Deemed to be University, India

**Dr. Indrajit Saha**

National Institute of Technical Teachers' Training & Research, India

**Prof. Janche Sang**

Cleveland State University, USA

**Prof. Chintakindi Sanjay**

GITAM University, India

**Prof. Midthe V. Srinath**

STET Women's College, India

**Dr. Eliot Winer**

The Iowa State University, USA

**Dr. Yongfeng Yin**

School of Reliability and System Engineering, Beihang

University (BUAA), China

**Prof. Xin Yuan**

Florida State University, USA

# Table of Contents

**Volume 18    Number 12**

**December 2025**

<b>Bridging the Gap: The AI-TPACK Model for Teacher Professional Development in Early Childhood AI Literacy</b>	
L. Y. Meng, M. D. Yu, L. Cheng, Y. F. Feng, Q. W. Wang.....	483
<b>A Mixture-of-Agents System for Fact-Based Comprehensive Search</b>	
M. Abu Bakar, V. Madiseti.....	507
<b>SAGENT: An Intelligent System for the Management of Complex Workflows</b>	
H. Wu, V. K. Madiseti .....	542
<b>Secure Offline: A Hardware-Bound Cryptographic Framework for Software License Validation in Internet Constrained Educational Environments</b>	
C. Kalembo, D. Ntalasha .....	564

# Journal of Software Engineering and Applications (JSEA)

## Journal Information

### SUBSCRIPTIONS

The *Journal of Software Engineering and Applications* (Online at Scientific Research Publishing, <https://www.scirp.org/>) is published monthly by Scientific Research Publishing, Inc., USA.

#### **Subscription rates:**

Print: \$89 per issue.

To subscribe, please contact Journals Subscriptions Department, E-mail: [sub@scirp.org](mailto:sub@scirp.org)

### SERVICES

#### **Advertisements**

Advertisement Sales Department, E-mail: [service@scirp.org](mailto:service@scirp.org)

#### **Reprints (minimum quantity 100 copies)**

Reprints Co-ordinator, Scientific Research Publishing, Inc., USA.

E-mail: [sub@scirp.org](mailto:sub@scirp.org)

### COPYRIGHT

#### **Copyright and reuse rights for the front matter of the journal:**

Copyright © 2025 by Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY).

<http://creativecommons.org/licenses/by/4.0/>

#### **Copyright for individual papers of the journal:**

Copyright © 2025 by author(s) and Scientific Research Publishing Inc.

#### **Reuse rights for individual papers:**

Note: At SCIRP authors can choose between CC BY and CC BY-NC. Please consult each paper for its reuse rights.

#### **Disclaimer of liability**

Statements and opinions expressed in the articles and communications are those of the individual contributors and not the statements and opinion of Scientific Research Publishing, Inc. We assume no responsibility or liability for any damage or injury to persons or property arising out of the use of any materials, instructions, methods or ideas contained herein. We expressly disclaim any implied warranties of merchantability or fitness for a particular purpose. If expert assistance is required, the services of a competent professional person should be sought.

### PRODUCTION INFORMATION

For manuscripts that have been accepted for publication, please contact:

E-mail: [jsea@scirp.org](mailto:jsea@scirp.org)

# Call for Papers



## Journal of Software Engineering and Applications (JSEA)

ISSN 1945-3116 (print) ISSN 1945-3124 (online)

<https://www.scirp.org/journal/jsea>

JSEA is a professional journal in the field of software engineering and application. The goal of this journal is to provide an international platform for engineers and academicians all over the world to promote, share, and discuss various new issues and development in the field of software engineering. It is an archival publication to disseminate the results of fundamental and applied research, especially those relevant to software engineering. This journal aims to encourage deeper understanding and greater effectiveness in the theory analysis and engineering application relevant to software engineering fields.

### Subject Coverage

All manuscripts must be prepared in English, and are subject to a rigorous and fair peer-review process. Generally, accepted papers will appear online within 3 weeks followed by printed hard copy. The journal publishes original papers including but not limited to the following fields:

Automated Software Design and Synthesis  
Automated Software Specification  
Component-Based Software Engineering  
Computer-Supported Cooperative Work  
Formal Methods  
Knowledge Acquisition  
Object-Oriented Technology  
Patterns and Frameworks  
Process and Workflow Management  
Program Understanding Issues  
Programming Languages and Software Engineering  
Reflection and Metadata Approaches  
Reliability and Fault Tolerance

Requirements Engineering  
Reverse Engineering  
Software Architecture  
Software Design Methods  
Software Domain Modeling and Meta-Modeling  
Software Engineering Decision Support  
Software Engineering Education  
Software Maintenance and Evolution  
Software Process Modeling  
Software Quality  
Software Reuse  
Software Testing  
Tutoring, Help, Documentation Systems

We are also interested in short papers (letters) that clearly address a specific problem, and short survey or position papers that sketch the results or problems on a specific topic. Authors of selected short papers would be invited to write a regular paper on the same topic for future issues of the JSEA.

### Notes for Prospective Authors

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. All papers are refereed through a peer review process. For more details about the submissions, please access the website.

### Website and E-mail

<https://www.scirp.org/journal/jsea>

E-mail: [jsea@scirp.org](mailto:jsea@scirp.org)