

**VNU JOURNAL OF SCIENCE:
COMPUTER SCIENCE AND COMMUNICATION ENGINEERING**

Editorial Board Chairman

Truong Vu Bang Giang
Vietnam National University, Hanoi, Vietnam

Editorial Board on Computer Science and Communication Engineering

Managing Editors

Nguyen Thanh Thuy - VNU University of Engineering and Technology, Hanoi, Vietnam
Dang Van Hung - VNU University of Engineering and Technology, Hanoi, Vietnam
Pham Bao Son - VNU University of Engineering and Technology, Hanoi, Vietnam
Le Sy Vinh - VNU University of Engineering and Technology, Hanoi, Vietnam
Dang Duc Hanh - VNU University of Engineering and Technology, Hanoi, Vietnam

Associate Editors

Le Hoai Bac - Ho Chi Minh City University of Technology, Vietnam
Ho Tu Bao - Japan Advanced Institute of Science and Technology, Japan
Huynh Thi Thanh Binh - Hanoi University of Science and Technology, Vietnam
Nguyen Thanh Binh - Da Nang University of Science and Technology, Vietnam
Claude Sammut - University of New South Wales, Australia
Dinh Dung - Information Technology Institute, VNU Hanoi, Vietnam
Dinh Trieu Duong - VNU University of Engineering and Technology, Hanoi, Vietnam
Le Dinh Duy - Ho Chi Minh City University of Information Technology, Vietnam
Lukasz Greda - Institute of Communications and Navigation, Germany
Phan Xuan Hieu - VNU University of Engineering and Technology, Hanoi, Vietnam
Nguyen Thi Minh Huyen - VNU University of Science, Hanoi, Vietnam
Jay Bagga - Ball State University, United States
Ho Van Khuong - Ho Chi Minh City University of Technology, Vietnam
Sylvain Lagrue - University of Artois, France
Bui Thu Lam - Le Quy Don Technical University, Vietnam
Xuandong Li - Nanjing University, China
Zhiming Liu - Southwest University, Chongqing, China
Pham The Long - Le Quy Don Technical University, Vietnam
Luong Chi Mai - Institute of Information Technology, VAST, Vietnam
Nguyen Le Minh - Japan Advanced Institute of Science and Technology, Japan
Sanjiva Prasad - Indian Institute of Technology Delhi, India
Le Hoang Son - VNU University of Science, Hanoi, Vietnam
Nguyen Huu Thanh - Hanoi University of Science and Technology, Vietnam
Quan Thanh Tho - Ho Chi Minh City University of Technology, Vietnam
Chu Duc Trinh - VNU University of Engineering and Technology, Hanoi, Vietnam
Cao Hoang Tru - Ho Chi Minh City University of Technology, Vietnam
Tran Xuan Tu - VNU University of Engineering and Technology, Hanoi, Vietnam
Wei-Ngan Chin - National University of Singapore, Singapore
Jean-Daniel Zucker - Institut de Recherche pour le Développement, France

Secretary

Chu Thai Ha	Dang Duc Hanh
VNU Journal of Science, Hanoi, Vietnam	VNU University of Engineering and Technology, Hanoi, Vietnam
Tel.: (84) 942541975;	Tel.: (84) 946686408;
E-mail: hact@vnu.edu.vn	E-mail: hanhdd@gmail.com

Aims and Scope

VNU Journal of Science: Computer Science and Communication Engineering publishes *double-blinded* peer-review research papers, communications and reviews dealing with: Computer science, Software engineering, Computer engineering, Information systems, Computer networks, Electronics and telecommunications.

Publication Information

The journal publishes *in June, December* by the Vietnam National University, Hanoi. As a fully open access publication, the journal will provide maximum exposure for published articles, making the research available to all to read and share. A corresponding print version is also available.

Any manuscript followed the journal's scope and author guideline will be assigned to managing editors. All manuscripts undergo an editorial screening and a double-blinded peer-review by at least one independent expert in the field. The managing editors make an editorial decision, which is subject to endorsement by the Editor-in-Chief.

Further Information is available through the journal website: <http://js.vnu.edu.vn>

Publication Permit No 223/GP-BTTTT, issued on Jul. 22nd 2014 and Permit (Revised) No 62/GP-BTTTT, issued on Jan. 29th 2021. Printed at Su That Printing House, No 201 Cau Dien Street, Bac Tu Liem District, Hanoi, Vietnam. Legal Deposit: Quarter II/2025.