

# Internetworking Indonesia Journal

The International Journal of ICT and Internet Development

- |                                                                                                                                                                                                                           |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Smart Bed and Battery Driven Auto Warm Bolster<br>based on Raspberry Pi and Arduino<br><i>Lorenzo Niro, Addo Hermawan, Rico Wijaya, Zener S. Lie,<br/>and Rinda Hedwig</i>                                                | 3  |
| Security System Based on Vibration and Infra-Red Sensors<br>Using Raspberry<br><i>Poltak Sihombing, Jos Timanta Tarigan, Benyamin Ginting,<br/>and Dahlan Sitompul</i>                                                    | 11 |
| Flood Early Warning Detection System Prototype<br>Based on IoT Network<br><i>Joni Welman Simatupang and Faiz Naufal</i>                                                                                                   | 17 |
| Dynamic Models Based Virtual Reality Flight Simulator<br><i>Kelvin Valentino, Kevin Christian, Singgih S. Wibowo,<br/>and Endra Joelianto</i>                                                                             | 23 |
| Artifact Removal with Independent Component Analysis<br>for 2D Brain Mapping of Drugs User before and after Taking Methadone<br><i>Shelly Iskandar, Dwi Esti Kusumandari, and Arjon Turnip</i>                            | 29 |
| Number of Vehicles and Travel Time Estimation on Urban<br>Traffic Network using Bayesian Network Model and Particle Filtering<br><i>Gilang S. Kuswana, Satria A. Ramadhan, Endra Joelianto,<br/>and Herman Y. Sutarto</i> | 35 |

(Continued)

|                                                                                                                                                                                                                                  |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Multiple-Sensors-Fusion for Localization of<br>a Container-Truck using a Fast Particle Filter<br><i>Rini N. Fatimah, Adi Suparyanto, Yul Yunazwin Nazaruddin,<br/>and Augie Widyotriatmo</i>                                     | 41 |
| A Modeling Approach for Mobile Monitoring and Supervisory<br>Control Development based on Open-source Programming<br><i>Seno D. Panjaitan, Bomo W. Sanjaya, Aryanto Hartoyo,<br/>Rudi Kurnianto, and F. Trias P. Wigyarianto</i> | 47 |
| Simulation of Traffic Control Using Vissim-COM Interface<br><i>Satria A. Ramadhan, Endra Joelianto, and Herman Y. Sutarto</i>                                                                                                    | 55 |
| A New Technique of Room Access Security based<br>Brain Computer Interface<br><i>Artha Ivonita Simbolon, M Faizal Amri, M. Agung Suhendra,<br/>and Arjon Turnip</i>                                                               | 63 |
| Drowsiness Alarm Using Infrared Sensor as Mean<br>of Accident Prevention<br><i>Erwin Sitompul and Hamim Maulana</i>                                                                                                              | 69 |
| Implementation of Augmented Virtuality in Virtual<br>Meeting Room Application<br><i>Eric Sumantri, Michael, Raymond Lesmana, and Handri Santoso</i>                                                                              | 75 |
| Statistical Analysis of Sleep Quality from EEG Signal<br>with Aromatic Stimuli<br><i>M. Turnip, L. Wijaya, A. Dharma, L. Anita Sarena, Dwi Esti K.,<br/>and A. Turnip</i>                                                        | 81 |
| The Effect of Cache Partitioning and Sharing<br>on Named Data Network<br><i>Leanna Vidya Yovita, Nana Rachmana Syambas,<br/>and Ian Yosef Matheus Edward</i>                                                                     | 87 |

# Internetworking Indonesia Journal

The International Journal of ICT and Internet Development

ISSN: 1942-9703

[www.InternetworkingIndonesia.org](http://www.InternetworkingIndonesia.org)

The *Internetworking Indonesia Journal* (IJ) is a peer reviewed international journal devoted to the timely study of Information and Communication Technology (ICT) and Internet development. The journal seeks high-quality research papers on the challenges and opportunities presented by information technology and the Internet, as well as their impact to society. Issues in the IJ covers the broad areas of computing, communications, engineering (software & hardware) and the broader area of internet technologies.

The journal provides open access to all of its content on the principle that making research freely available to the public supports a greater global exchange of knowledge. This follows the philosophy of the Open Journal Systems (see the Public Knowledge Project at [pkp.sfu.ca](http://pkp.sfu.ca)). The IJ issues are published electronically (PDF) and there are no subscription fees. Such access is associated with increased readership and increased citation of an author's work.

Journal mailing address: Internetworking Indonesia Journal, PO Box 397110 MIT Station, Cambridge, MA 02139, USA.

## Computing, Communications, Engineering & Internet Technologies

The Internetworking Indonesia Journal covers the broad technical areas of computing, communications, engineering and Internet Technologies.

Possible topics for papers include, but are not limited to the following:

- Information technology and information systems
- Communications technology
- Software and hardware engineering
- Algorithms and computation
- Applications and services
- Broadband and telecommunications technologies
- Mobile and wireless networks
- Internet infrastructure systems, protocols, standards and technologies
- Multimedia and content development
- Education and distant learning
- Open source software development and deployment
- Cloud Computing, SaaS, and Grid Computing

## Co-Editors

Thomas Hardjono, PhD  
(MIT, USA)

Henri Uranus, PhD  
(UPH, Indonesia)

Budi Rahardjo, PhD  
(ITB, Indonesia)

## International Advisory Board

Prof. Edy Tri Baskoro, PhD (ITB, Indonesia)  
Mark Baugher, MA (Cisco Systems, USA)  
Lakshminath Dondeti, PhD (Qualcomm, USA)  
Paul England, PhD (Microsoft Research, USA)  
Brian Haberman, PhD (Johns Hopkins University, USA)  
Prof. Svein Knapskog, PhD (NTNU, Norway)  
Prof. Bambang Parmanto, PhD (University of Pittsburgh, USA)

Prof. Wishnu Prasetya, PhD (Utrecht University, The Netherlands)  
Graeme Proudler, PhD (HP Laboratories, UK)  
Prof. Susanto Rahardja, PhD (NUS, Singapore)  
Prof. Jennifer Seberry, PhD (University of Wollongong, Australia)  
Prof. Willy Susilo, PhD (University of Wollongong, Australia)  
Prof. David Taniar, PhD (Monash University, Australia)  
Dr. Kuncoro Wastuwibowo, IEEE Indonesia

## Technical Review Board

Moch Arif Bijaksana, MSc (IT Telkom, Indonesia)  
Teddy Surya Gunawan, PhD (IIUM, Malaysia)  
Brian Haberman, PhD (Johns Hopkins University, USA)  
Dwi Handoko, PhD (BPPT, Indonesia)  
Martin Gilje Jaatun, PhD (SINTEF, Norway)  
Endra Joelianto (ITB, Indonesia)  
Mira Kartiwi, PhD (IIUM, Malaysia)  
Maciej Machulak, PhD (Google, USA)  
Ihan Martoyo (UPH, Indonesia)

Jesus Molina, PhD (Fujitsu Laboratories of America)  
Bobby Nazief, PhD (UI, Indonesia)  
Anto Satriyo Nugroho, PhD (BPPT, Indonesia)  
Muhammad Suryanegara (UI, Indonesia)  
Bernardi Pranggono, PhD (University of Leeds, UK)  
Bambang Prastowo, PhD (UGM, Indonesia)  
Bambang Riyanto, PhD (ITB, Indonesia)  
Andriyan Bayu Suksmo, PhD (ITB, Indonesia)  
Setiadi Yazid, PhD (UI, Indonesia)

# Internetworking Indonesia Journal

The International Journal of ICT and Internet Development

ISSN: 1942-9703

[www.InternetworkingIndonesia.org](http://www.InternetworkingIndonesia.org)

The *Internetworking Indonesia Journal* (IJ) is a peer reviewed international journal devoted to the timely study of Information and Communication Technology (ICT) and Internet development. The journal seeks high-quality research papers on the challenges and opportunities presented by information technology and the Internet, as well as their impact to society. Issues in the IJ covers the broad areas of computing, communications, engineering (software & hardware) and the broader area of internet technologies.

The journal provides open access to all of its content on the principle that making research freely available to the public supports a greater global exchange of knowledge. This follows the philosophy of the Open Journal Systems (see the Public Knowledge Project at [pkp.sfu.ca](http://pkp.sfu.ca)). The IJ issues are published electronically (PDF) and there are no subscription fees. Such access is associated with increased readership and increased citation of an author's work.

Journal mailing address: Internetworking Indonesia Journal, PO Box 397110 MIT Station, Cambridge, MA 02139, USA.

## Publication Policies

**Open Access Publication Policy:** The Internetworking Indonesia Journal (IJ) provides open access to all of its content on the principle that making research freely available to the public supports a greater global exchange of knowledge. This follows the philosophy of the Open Journal Systems (see the Public Knowledge Project at [pkp.sfu.ca](http://pkp.sfu.ca)). The IJ issues are published electronically (PDF) and there are no subscription fees. Such access is associated with increased readership and increased citation of an author's work.

**No publication fees:** There is no publication fees to authors for publishing in the IJ. This is consistent with the open access philosophy adopted by the IJ.

**Copyright Policy:** The IJ adopts the *Creative Commons Attribution Non-Commercial No Derivatives* (by-nc-nd) license. The IJ is an academic journal dedicated to the open exchange of information. For this reason, the IJ is freely available to individuals and institutions. Copies of this journal or articles in this journal may be distributed for research or educational purposes free of charge and without permission. However, commercial use of the IJ website or the articles contained herein is expressly prohibited without the written consent of the editor.

Authors who publish in the IJ will release their articles to the IJ under the Creative Commons Attribution Non-Commercial No Derivatives (by-nc-nd) license. This license allows anyone to copy and distribute the article for non-commercial purposes provided that appropriate attribution is given. For details of the rights authors grants users of their work, see the "human-readable summary" of the license, with a link to the full license:

- Creative Commons licenses: <http://creativecommons.org/licenses/>
- Human-readable summary: <http://creativecommons.org/licenses/by-nc-nd/2.5/>
- Full license: <http://creativecommons.org/licenses/by-nc-nd/2.5/legalcode>

## Manuscript Submission Guidelines

**Language:** The primary language of the Internetworking Indonesia Journal is English due to its international readership. Note that the IJ does not accept requests for the translation of submitted manuscripts.

**Format:** Papers should be submitted using the IJ Template document for MS-Word. The IJ format is derived from the popular IEEE 2-column text format. The IJ template can be found on the IJ website.

**Length of manuscript:** Papers submitted to the IJ should not exceed 7 pages of the IJ 2-column format.

**Originality:** Papers submitted to the IJ must not have been previously published or committed to another publisher under a copyright transfer agreement, and must not be under consideration by another journal. Papers previously published at conferences can be submitted to the IJ, but must be revised so that it has significant differences from the conference version.

**Ethics Statement:** Authors wishing to submit papers to the IJ are requested to read and agree to the IJ *Publication Ethics Statement*, which can be found on the IJ website.

Internetworking Indonesia Journal  
ISSN: 1942-9703  
[www.InternetworkingIndonesia.org](http://www.InternetworkingIndonesia.org)