IEEE Software
TABLE OF CONTENTS
January/February 2015 Vol. 32 No. 1

FOCUS

INTERNETWARE AND BEYOND

35 Guest Editors' Introduction
Software Engineering for Internet Computing: Internetware and Beyond
Antonia Bertolino, M. Brian Blake, Pankaj Mehra, Hong Mei, and Tao Xie

38 Debugging the Internet of Things: The Case of Wireless Sensor Networks
Patrick Eugster, Vinaitheerthan Sundaram, and Xiangyu Zhang

50 Automated Synthesis of Service Choreographies
Marco Autili, Paola Inverardi, and Massimo Tivoli

58 Stigmergy-Based Construction of Internetware Artifacts
Wei Zhang, Haiyan Zhao, Yi Jiang, and Zhi Jin

67 Diagnosing Energy Efficiency and Performance for Mobile Internetware Applications
Yepang Liu, Chang Xu, and Shing-Chi Cheung

76 A Tail-Tolerant Cloud API Wrapper
Qinghua Lu, Xiwei Xu, Len Bass, Liming Zhu, and Weishan Zhang

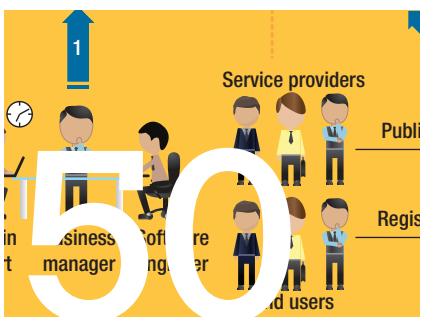
See www.computer.org/software-multimedia for multimedia content related to the features in this issue.

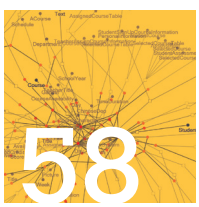
83 Multitier Diversification in Web-Based Software Applications
Simon Allier, Olivier Barais, Benoit Baudry, Johann Bourcier, Erwan Daubert, Franck Fleurey, Martin Monperrus, Hui Song, and Maxime Tricoire

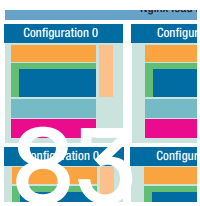
91 Roundtable
The Future of Software Engineering for Internet Computing
Jian Lü, David S. Rosenblum, Tevfik Bultan, Valerie Issarny, Schahram Dustdar, Margaret-Anne Storey, and Dongmei Zhang

FEATURE

98 The Road Ahead for Architectural Languages
Patricia Lago, Ivano Malavolta, Henry Muccini, Patrizio Pelliccione, and Antony Tang







DEPARTMENTS

4 From the Editor

Fewer Dead Trees, More Engagement
Diomidis Spinellis

11 On Computing

Of Boilers, Bit, and Bots
Grady Booch

14 Reliable Code

To Code Is Human
Gerard J. Holzmann

18 Requirements

Toward Meaningful Industrial–Academic Partnerships
Jane Cleland-Huang

22 Software Technology

What Next? Advances in Software-Driven Industries
Christof Ebert, Gerd Hoefner, and Mani V.S.

29 Impact

Mobile Money's Impact on Tanzanian Agriculture
Balachandran Seetharam and Drew Johnson

106 Voice of Evidence

How Do I Know Whether to Trust a Research Result?
Martin Shepperd

110 The Pragmatic Architect

The Five Properties of Successful Architectural Oversight
Nick Rozanski

116 Software Engineering

Microservices
Johannes Thönes

MISCELLANEOUS

5 How to Reach Us

8 2014 Reviewers

82 IEEE Computer Society Information

90 Advertiser Information