ANUARY • FEBRUARY 2016

nternet Computing

The Pales



IEEE

IEEE @computer society



JANUARY/FEBRUARY 2016, VOLUME 20, NUMBER 1

DEPARTMENTS

Spotlight

52 Task Automation Services: Automation for the Masses

Miguel Coronado and Carlos A. Iglesias

Developing World

60 Back to the Future: Lessons for Internet of Energy Networks

Shivkumar Kalyanaraman

Beyond Wires

66 Diagnosing Mobile Apps' Quality of Experience: Challenges and Promising Directions

Z. Morley Mao

View from the Cloud

70 Pegasus in the Cloud: Science Automation through Workflow Technologies

Ewa Deelman, Karan Vahi, Mats Rynge, Gideon Juve, Rajiv Mayani, and Rafael Ferreira da Silva

Www.computer.org/internet/

This publication is indexed by ISI (Institute for Scientific Information) in SciSearch, Research Alert, the CompuMath Citation Index, and Current Contents/Engineering, Computing, and Technology. Postmaster: Send undelivered copies and address changes to IEEE Internet Computing, IEEE Service Center, 445 Hoes Ln, Piscataway, INI 08855-1331. Periodicals postage paid at New York, NY, and at additional mailing offices. Canadian GST #126564188. Canada Post Publications Mail Agreement Number 40013895. Return undeliverable Canadian addresses to PO Box 122, Niagara Falls, ON 1226 688. Printed in the USA. Circulation IEEE Internet Computing (ISSN 1089-7801) is published binorithly by the IEEE Computer Society, IEEE headquarters: 1820 t. St. N.W., Suite 1202, Washington, D.C. 20036-5104, IEEE Computer Society headquarters: 1820 t. St. N.W., Suite 1202, Washington, D.C. 20036-5104, IEEE Computer Society Publications Office: 10662 Las Vaqueros Circle, PO Box 3014, Los Alamitos, Calif. 90720; (714) 821-4010. Subscription rates: IEEE Computer Society members get the lowest rates and choice of media option — USS4817,300 for member/nonmember institutional print + online. For information on other prices or to order, go to www.computer.org/subscribe. Back issues: \$20 for members, \$173 for nonmembers. Reuse Rights and Reprint Permissions: Educational or personal use of this material is permitted without fee, provided such use: 1) is not made for profit; 2) includes this notice and a full citation to the original work on the first space of the copy; and 3) does not imply IEEE endorsement of any third-party products or services. Authors and their companies are permitted topost the accepted version of their IEEE-copyright and activation to the original work appear on the first serven of the posted copy. An accepted manuscript is a version which has been reviewed by the author to incorporate review suggestions, but not the published version to the ripropery Rights Office, 445 Hoes Lane, Piscataway, NJ 08854



s-permissions/giree.org, Copyright & 2016 IEEE. All rights reserved. Abstracting and Library Use: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy for private use of patrons, provided the per-copy fee indicated in the code at the bottom of the first page is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

Big Data Bites

78 Searching from Mars

Jimmy Lin, Charles L.A. Clarke, and Gaurav Baruah

COLUMNS

From the Editors

4 Professions for Web 10.0

M. Brian Blake

Practical Security

83 Both Sides Now: Thinking about Cloud Security

Hilarie Orman

Backspace

88 The Fragmentation of the Internet

Vinton G. Cerf

- 1 Call for Papers
- 27 IEEE Computer Society Info
- 76 Advertiser Index



The Internet has facilitated the creation of economies that might have been previously unimaginable — ranging from targeted online advertising to crowdsourcing to peer-topeer lending and digital currencies — and the Internet is only growing in scale. This special issue discusses the modeling, analysis, and design of Internet-specific economic activity, considering research challenges surrounding both Internet economies that are "in plain sight" and "undercover."

Cover by Giacomo Marchesi, bucket@earthlink.net

INTERNET ECONOMICS

8 Guest Editors' Introduction

Arpita Ghosh and Ashish Goel

12 The Economics of Reputation and Feedback Systems in E-Commerce Marketplaces

Steven Tadelis

20 The Importance of Exploration in Online Marketplaces

Siddhartha Banerjee, Ramesh Johari, and Zhengyuan Zhou

28 Optimizing Display Advertising Markets: Challenges and Directions

Nitish Korula, Vahab Mirrokni, and Hamid Nazerzadeh

36 Pricing the Cloud Ian A. Kash and Peter B. Key

FEATURE

44 FPGA-Based Web Services — Infinite Potential or a Road to Nowhere?

Robert Brzoza-Woch and Piotr Nawrocki

For more information on these or any other computing topics, please visit the IEEE Computer Society Digital Library at www.computer.org/publications/dlib.