

DEPARTMENT: FROM THE PRESIDENT

New Ways to Think About CS Education

Two new approaches could have an impact on both the quality of CS education and on our professional responsibilities to society.

Cherri M. Pancake

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DEPARTMENT: CERF'S UP

Multisensory Adventures

Two books, one published to great acclaim and the other still in process, resonate with a visceral intensity for which I was honestly unprepared and surprised.

Vinton G. Cerf

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DEPARTMENT: LETTERS TO

THE EDITOR

Adding More Color to Patch Picture

"Automated Program Repair" (Dec. 2019) holds out the promise of substantially improving software quality. Quantitative data can help researchers and practitioners better understand the capabilities and current limitations of ...

CACM Staff

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DEPARTMENT: BLOG@CACM

Teaching Teachers to Offer STEM to Undergrads

Mark Guzdial considers how teaching computing to undergraduates requires better education of the teachers as well.

Mark Guzdial

Pages 10-11

COLUMN: LAST BYTE

Reinventing Virtual Machines

The notion of scalable operating systems led Mendel Rosenblum to virtual machines, which have revolutionized datacenters and enabled modern cloud computing.

Leah Hoffmann

Pages 128-ff

COLUMN: NEWS

Dead Languages Come to Life

Artificial intelligence automates the translation of extinct languages.

Gary Anthes

Pages 13-15

Machine Learning, Meet Whiskey

Technologies are coming increasingly closer to approximating the human senses of taste and smell.

Gregory Mone

Pages 16-17

How Universities Deploy Student

Data

Personalizing efforts to drive greater student retention and success.

Esther Shein

Pages 18-20

The Temptation of Data-Enabled Surveillance

Are universities the next cautionary tale?

Alan Rubel, Kyle M. L. Jones

Pages 22-24

STRATEGY AND MANAGEMENT

Artificial Intelligence and the Future of Professional Work

Considering the implications of the influence of artificial intelligence given previous industrial revolutions.

Mari Sako

Pages 25-27

Master of Tickets

Valuing the quality, not the quantity, of work.

George V. Neville-Neil

Pages 28-29

Why Is Cybersecurity Not a Human-Scale Problem Anymore?

Examining the structure of the enterprise attack surface in view of the relative ease with which cyberdefenses can be subverted.

Gaurav Banga

Pages 30-34

at ACM Conferences

Seeking to improve access to conferences and provide support for attendees with children.

Audrey Girouard, Jon E. Froehlich, Regan L. Mandryk, Mark Hancock

Pages 35-38

Assistants

Rating your intelligent (human or automated) assistant.

Jerrold M. Grochow

Pages 39-41

OCEANIA REGION SPECIAL SECTION

Welcome

Welcome to the special section covering East Asia and Oceania, which includes Southeast Asia, Oceania, and Asia-Pacific countries including Japan and Korea.

Sue Moon, Ann Nicholson, Abhik Roychoudhury

Pages 44-46

OCEANIA REGION SPECIAL SECTION: HOT TOPICS

The NII Shonan Meeting in Japan

Since the inaugural NII Shonan Meeting in February 2011, more than 140 meetings have been held with participants representing 60 countries and regions.

Capturing Cultural Heritage in East

Asia and Oceania

How to capture (the experience of) cultural objects in digital form?

Sally Jo Cunningham, Fariz Darari, Adila Krisnadhi, Annika Hinze

Pages 50-52

Cybersecurity in Pacific Island

Nations

One security issue that has begun to emerge and will only accelerate without individual and collective action is the threat of cyberattacks and cybercrime in the Oceania region.

Carsten Rudolph, Sadie Creese, Sameer Sharma

Pages 53-54

Singapore's Cybersecurity

Ecosystem

Since 2013, Singapore's medium- to long-term directions for cybersecurity is to develop R&D expertise and capabilities to improve the trustworthiness of cyber infrastructures and systems.

Karen Teh, Vivy Suhendra, Soon Chia Lim, Abhik Roychoudhury

Pages 55-57

Innovating Services and

Digital Economy in Singapore

A report on Singapore's technology development in the services and digital economy, with insights for research over the next five years.

Thomas Ho Chee Tat, George Loh Chee Ping

Pages 58-59

SECTION: EAST ASIA AND

OCEANIA REGION SPECIAL SECTION: BIG TRENDS

AI Singapore: Empowering a Smart Nation

The AI Singapore national initiative was launched in June 2017 as an integrated, impact-driven, research and innovation program in artificial intelligence for the entire country.

Sintia Teddy-Ang, Abigail Toh

Pages 60-63

Developing AI for Law Enforcement

in Singapore and Australia

The Intelligent Case Retrieval System (ICRS), using AI capabilities, better enables all parties to evaluate the strengths or weaknesses of their legal cases.

Lam Kwok Yan, Campbell Wilson

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Digital Healthcare Across Oceania

What is the current state of progress of digital health?

Chris Bain, Abraham Oshni Alvandi

Pages 64-67

News in Social Media: An Asia-Pacific Perspective

Many of the latest techniques to automatically debunk fake news were initiated in the Asia and Oceania region.

Meeyoung Cha, Wei Gao, Cheng-Te Li

Pages 68-71

seL4 in Australia: From Research to

Real-World Trustworthy Systems

An overview of developments, and of ongoing research, related to the correctness proof of the seL4 microkernel.

Gernot Heiser, Gerwin Klein, June Andronick

Pages 72-75

Advances in Security Research

in the Asiacrypt Region

Members of the International Association for Cryptologic Research explore regional work and collaboration activities.

Raphaël CW Phan, Masayuki Abe, Lynn Batten, Jung Hee Cheon, Ed Dawson, Steven Galbraith, Jian Guo, Lucas Hui, Kwangjo Kim, Xuejia Lai, Dong Hoon Lee, Mitsuru Matsui, Tsutomu Matsumoto, Shiho Moriai, Phong Nguyen, Dingyi Pei, Duong Hieu Phan, Josef Pieprzyk, Huaxiong Wang, Hank Wolfe, Duncan Wong, Tzong-Chen Wu, Bo-Yin Yang, Siu-Ming Yiu, Yu Yu, Jianying Zhou

Pages 76-81

5G

Commercialization and Trials in Korea

Government-industry 5G collaborations, including the R&D roadmap, the first 5G experience, and 5G vertical trials made the 5G-enabled industrial transformation take place in Korea.

Dong Ku Kim, Hyeonwoo Lee, Seong-Choon Lee, Sunwoo Lee

Pages 82-85

Asia's Surging Interest in Binary

Analysis

The expanding cyber infrastructure in Asia has ignited strong interests in software security, leading to a surge of research activities in binary analysis in the region.

Sang Kil Cha, Zhenkai Liang

Pages 86-88

SECTION: PRACTICE

Managing the Hidden Costs of Coordination

Controlling coordination costs when multiple, distributed perspectives are essential.

Laura M. D. Maguire

Pages 90-96

Cognitive Work of Hypothesis

Exploration During Anomaly Response

A look at how we respond to the unexpected.

Marisa R. Grayson

Pages 97-103

SECTION: CONTRIBUTED

ARTICLES

Cyber Warranties: Market Fix or Marketing Trick?

Risk transfer options offer hope, but little more.

Daniel W. Woods, Tyler Moore

Pages 104-107

SECTION: REVIEW ARTICLES

The Antikythera Mechanism

The discovery of this calculating machine is so significant that part of the history of ancient technology must be rewritten.

Herbert Bruderer

Pages 108-115

SECTION: RESEARCH

HIGHLIGHTS

Technical Perspective: An Answer to Fair Division's Most Enigmatic Question

The envy-free cake-cutting problem stood its ground for two decades, until it was cracked by Aziz and Mackenzie. Their solution is presented in "A Bounded and Envy-Free Cake Cutting Algorithm."

Ariel D. Procaccia

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**A Bounded and
Envy-Free Cake**

Cutting Algorithm

We report on our algorithm that resolved the well-studied cake cutting problem in which the goal is to find an envy-free allocation of a divisible resource based on queries from agents.

Haris Aziz, Simon Mackenzie

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