

DEPARTMENT: EDITOR'S LETTER

## Start Small, Then Achieve Big Impact

ACM owes its success to an amazing cadre of volunteers around the globe, and they deserve the credit for what ACM accomplishes.

*Cherri M. Pancake*

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DEPARTMENT: CERF'S UP

## On Durability

I have become convinced that our consuming societies, at least in the economically "developed" world, have become sources of harm to ourselves and our planet.

*Vinton G. Cerf*

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DEPARTMENT: BLOG@CACM

## Sizing the U.S. Student Cohort for Computer Science

Mark Guzdial considers indicators that U.S. K-12 students will study computer science.

*Mark Guzdial*

Pages 10-11

COLUMN: NEWS

## Learning to Trust Quantum Computers

They need to show us they can solve the biggest problems.

*Chris Edwards*

Pages 13-15

## Dark Web's Doppelgängers

## Aim to Dupe Antifraud Systems

Digital doppelgängers that fool online payment fraud detection systems are a threat to your bank balance.

*Paul Marks*

Pages 16-18

## Tracking Shoppers

Retailers of all stripes are using technology to follow consumers through their brick-and-mortar stores in order to develop detailed profiles of their shopping habits and preferences.

*Keith Kirkpatrick*

Pages 19-21

COLUMN: GLOBAL

COMPUTING

## Are We Losing Momentum?

Estimating when the second half of the world will come online.

*Carlos Iglesias, Dhanaraj Thakur, Michael L. Best*

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COLUMN: INSIDE RISKS

## Are You Sure Your Software Will Not Kill Anyone?

Using software to control potentially unsafe systems requires the use of new software and system engineering approaches.

*Nancy Leveson*

Pages 25-28

COLUMN: KODE VICIOUS

## Numbers Are for Computers, Strings Are for Humans

How and where software should translate data into a human-readable form.

*George V. Neville-Neil*

Pages 29-30

COLUMN: VIEWPOINT

## When Human-Computer Interaction Meets Community Citizen Science

Empowering communities through citizen science.

*Yen-Chia Hsu, Illah Nourbakhsh*

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## Guiding Students to Develop

### Essential Skills

Students should interact with one another to practice skills and construct their own understanding, with assistance from a teacher acting as a coach and guide — not a lecturer.

*Clif Kussmaul*

Pages 35-37

SECTION: PRACTICE

## Opening Up the Baseboard Management Controller

If the CPU is the brain of the board, the BMC is the brain stem.

*Jessie Frazelle*

Pages 38-40

## Optimizations in C++ Compilers

A practical journey.

*Matt Godbolt*

Pages 41-49

SECTION: CONTRIBUTED

### ARTICLES

## Toward ML-Centric Cloud Platforms

Exploring the opportunities to use ML, the possible designs, and our experience with Microsoft Azure.

*Ricardo Bianchini, Marcus Fontoura, Eli Cortez, Anand Bonde, Alexandre Muzio, Ana-Maria Constantin, Thomas Moscibroda, Gabriel Magalhaes, Girish Bablani, Mark Russinovich*

Pages 50-59

## Directions for Professional

### Social Matching Systems

Future PSM systems will require diversity-enhancing yet contextually sensitive designs.

*Thomas Olsson, Jukka Huhtamäki, Hannu Kärkkäinen*

Pages 60-69

SECTION: REVIEW ARTICLES

## Fuzzing: Hack, Art, and Science

Reviewing software testing techniques for finding security vulnerabilities.

*Patrice Godefroid*

Pages 70-76

SECTION: RESEARCH

### HIGHLIGHTS

## Technical Perspective: Lighting the Way to Visual Privacy

"Automating Visual Privacy Protection Using a Smart LED," presents a new technique to address the issue of cameras capturing proprietary or private information—it stops most digital cameras from recording a useful image while ...

*Marco Gruteser*

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## **Automating Visual Privacy Protection**

### **Using a Smart LED**

We introduce LiShield, which automatically protects a physical scene against photographing, by illuminating it with smart LEDs flickering in specialized waveforms.

*Shilin Zhu, Chi Zhang, Xinyu Zhang*

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COLUMN: LAST BYTE

### **'Everything Fails All the Time'**

Werner Vogels, an expert on ultra-scalable systems, talks about listening to customers, reconceptualizing the stack, and building a product-centered culture.

*Leah Hoffmann*

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