

DEPARTMENT: CERF'S UP

Repairability Redux

Manufactured goods today do not seem to take into account the possibility of repair.

Vinton G. Cerf

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DEPARTMENT:

BLOG@CACM

Pitting Computers Against Each Other . . . in Chess

Guest blogger Monroe Newborn on the 50th anniversary of ACM computer chess tournaments.

Monroe "Monty" Newborn

Pages 6-7

COLUMN: NEWS

Tracking COVID, Discreetly

Tracing the contacts of those who come into contact with the coronavirus is not that simple.

Neil Savage

Pages 9-11

Softening Up
Robots

Giving robots soft, artificial skin would enable them to work more closely with people.

Esther Shein

Pages 12-14

Technologies
for the Visually

Impaired

The last decade has seen major advancements in technology for the blind and visually impaired, but problems remain.

Logan Kugler

Pages 15-17

COLUMN: COMPUTING

ETHICS

Operationalizing AI Ethics Principles

A better ethics analysis guide for developers.

Cansu Canca

Pages 18-21

COLUMN:

BROADENING PARTICIPATION

U.S. States Must Broaden Participation While Expanding Access to Computer Science Education

Incorporating equity and inclusion in the effort toward access for everyone.

W. Richards Adrion, Sarah T. Dunton, Barbara Ericson, Renee Fall, Carol Fletcher, Mark Guzdial

Pages 22-25

COLUMN: THE

PROFESSION OF IT

Navigating in Real-Time Environments

An interview with Jim Selman.

Peter J. Denning

Pages 26-28

COLUMN: KODE

VICIOUS

Removing Kode

Dead functions and dead features.

George V. Neville-Neil

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COLUMN: VIEWPOINT

Silicon Politics

Tracing the widening path between Silicon Valley and Washington, D.C.

Margaret O'Mara

Pages 30-32

Federated
Learning for

Privacy-Preserving AI

Engineering and algorithmic framework to ensure data privacy and user confidentiality.

Yong Cheng, Yang Liu, Tianjian Chen, Qiang Yang

Pages 33-36

SECTION: PRACTICE

The Life of a Data Byte

Be kind and rewind.

Jessie Frazelle

Pages 38-45

Security
Analysis of

SMS as a Second Factor of Authentication

The challenges of multifactor authentication based on SMS, including cellular security deficiencies, SS7 exploits, and SIM swapping.

Roger Piqueras Jover

Pages 46-52

SECTION:

CONTRIBUTED ARTICLES

Green AI

Creating efficiency in AI research will decrease its carbon footprint and increase its inclusivity as deep learning study should not require the deepest pockets.

Roy Schwartz, Jesse Dodge, Noah A. Smith, Oren Etzioni

Pages 54-63

The Dark Triad
and Insider

Threats in Cyber Security

Tracing the relationship between pathological personality traits and insider cyber sabotage.

Michele Maasberg, Craig Van Slyke, Selwyn Ellis, Nicole Beebe

Pages 64-80

Measuring Internet Speed: Current Challenges and Future Recommendations

Speed testing methods have flourished over the last decade, but none without at least some limitations.

Nick Feamster, Jason Livingood

Pages 72-80

HIGHLIGHTS

Technical Perspective: XNOR-Networks – Powerful but Tricky

How to produce a convolutional neural net that is small enough to run on a mobile device, and accurate enough to be worth using? The strategies in "Enabling AI at the Edge with XNOR-Networks" are the best known to date.

David Alexander Forsyth

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Enabling AI at the Edge with

XNOR-Networks

We present a novel approach to running state-of-the-art AI algorithms in edge devices, and propose two efficient approximations to standard convolutional neural networks.

Mohammad Rastegari, Vicente Ordonez, Joseph Redmon, Ali Farhadi

Pages 83-90

Technical Perspective:

The Future of Large-Scale Embedded Sensing

The system described in "SATURN: An Introduction to the Internet of Materials" works passively, energized essentially by static electricity generated as layers move relative to each other during vibration.

Joseph A. Paradiso

Page 91

SATURN: An Introduction to

the Internet of Materials

We propose an Internet of Materials, where the very materials of objects and surfaces are augmented or manufactured to have computational capabilities.

Nivedita Arora, Thad Starner, Gregory D. Abowd

Pages 92-99

Walden Three

Can humanity take its next step forward by taking a step back?

William Sims Bainbridge

Pages 104-ff