Cybersecurity

Michael Soltys
Professor and Chair of Computer Science

April 17, 2019

MIT Enterprise Forum Central Coast

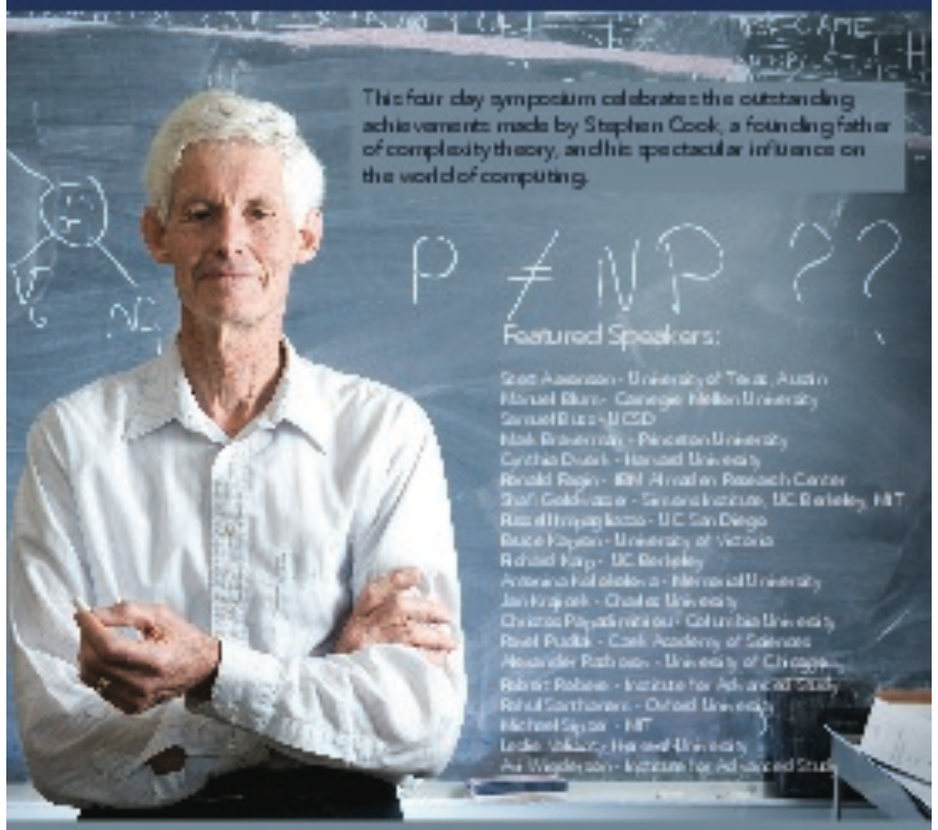
Channel Islands
CALIFORNIA STATE UNIVERSITY

University of Toronto

THE FIELDS INSTITUTE

Symposium on 50 Years of Complexity Theory: A Celebration of the Work of Stephen Cook

May 6-9, 2019 • The Fields Institute



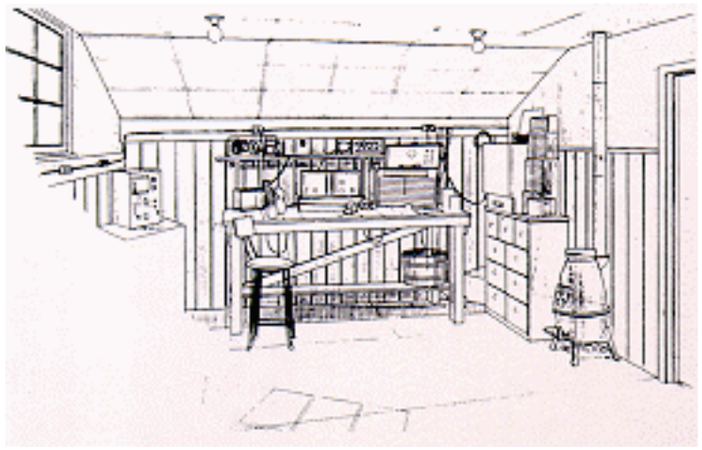
Scientific Programming Committee: Paul Beame (Chair), Bruce Kapron, Antonina Kolokolova, Toniann Pitassi

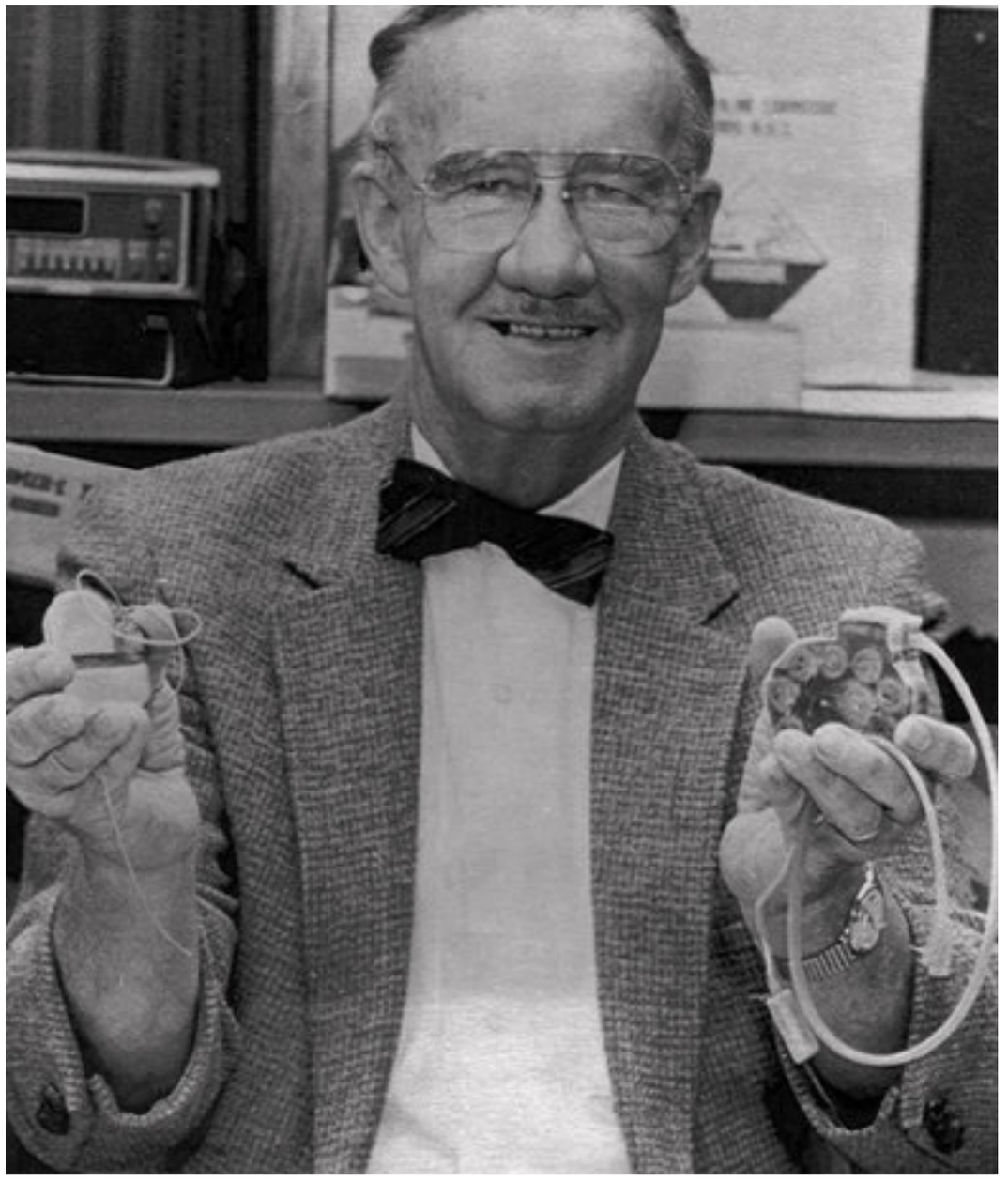
Organizing Committee: Toniann Pitassi (Chair), Allan Borodin, Arvind Gupta

For more information, or to register, please visit:
http://www.fields.utoronto.ca/activities/18-19/NP50

THE FIELDS INSTITUTE FOR RESEARCH IN MATHEMATICAL SCIENCES

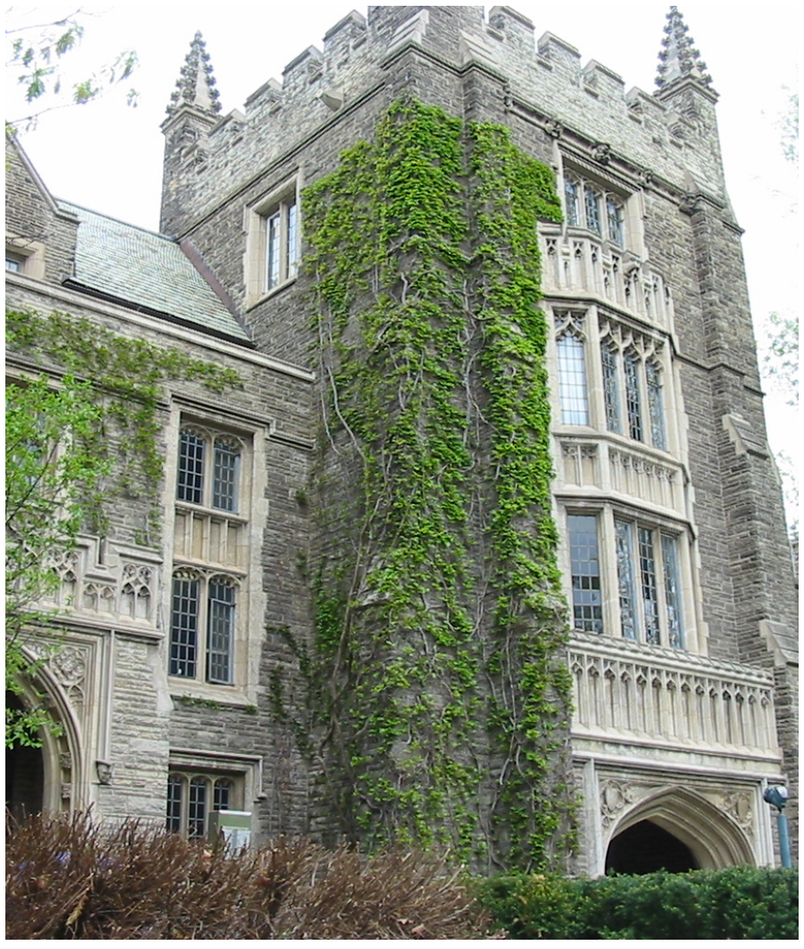
Wilson Greatbatch





- Inventor of 1st implantable pacemaker
- workshop in barn in Clarence, NY
- 10 year old Stephen Cook a precocious neighbor

McMaster University



CSU
Channel Islands

PLA Unit 61398

部队

Datong Road, Shanghai

F-35
2008

WANTED
BY THE FBI

Conspiring to Commit Computer Fraud; Accessing a Computer Without Authorization for the Purpose of Commercial Advantage and Private Financial Gain; Damaging Computers Through the Transmission of Code and Commands; Aggravated Identity Theft; Economic Espionage; Theft of Trade Secrets

UglyGorilla

Huang Zhenyu

Wen Xinyu

Sun Kailiang

Gu Chunhui

Wang Dong

“There are two kinds of big companies In the United States. Those who have been hacked by the Chinese, and those who don’t know they have been hacked by the Chinese”

–Director of FBI, October 5, 2014

Podesta Hack 2016

Google

Someone has your password

Hi John

Someone just used your password to try to sign in to your Google Account john.podesta@gmail.com.

Details:
Saturday, 19 March, 8:34:30 UTC
IP Address: 134.249.139.239
Location: Ukraine

Google stopped this sign-in attempt. You should change your password immediately.

CHANGE PASSWORD

Best,
The Gmail Team

You received this mandatory email service announcement to update you about important changes to your Google product or account.

WannaCry
2016

Jeremiah Grossman
@jeremiahg

They refused the pay the $6,500 ransom demand…

"A Battle Creek, Mich. medical practice is being forced to shut its doors after cyberattackers wiped out its files when the firm refused to pay a ransom."

> **SC Media** @SCMagazine
> Michigan medical practice folds after ransomware attack l ow.ly/v8bG30oixa2

32 1:36 PM - Apr 2, 2019

51 people are talking about this

Emotet
Dec 12, 2018

http://bit.ly/2GdGLBB

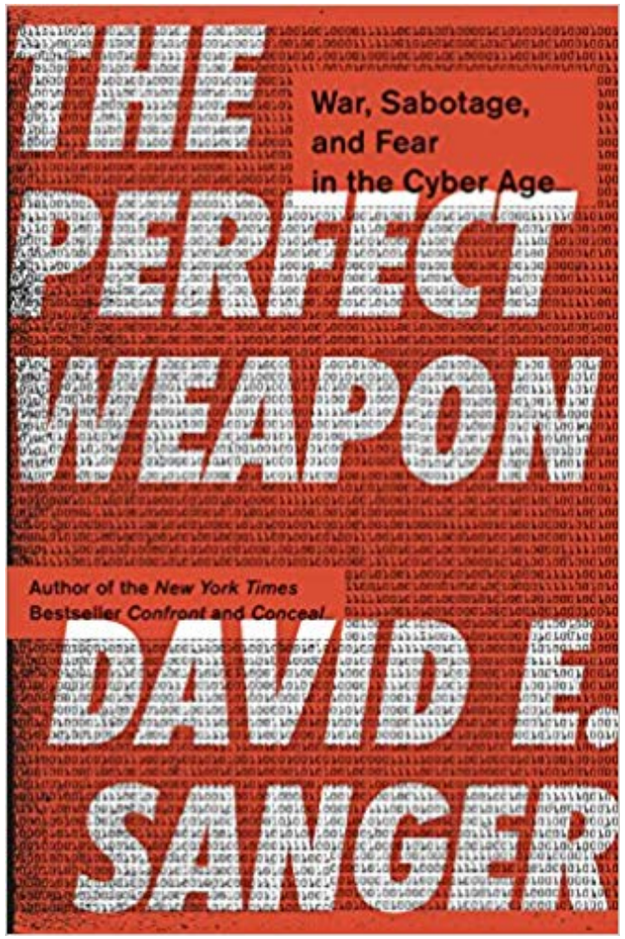
Kim Zetter
@KimZetter

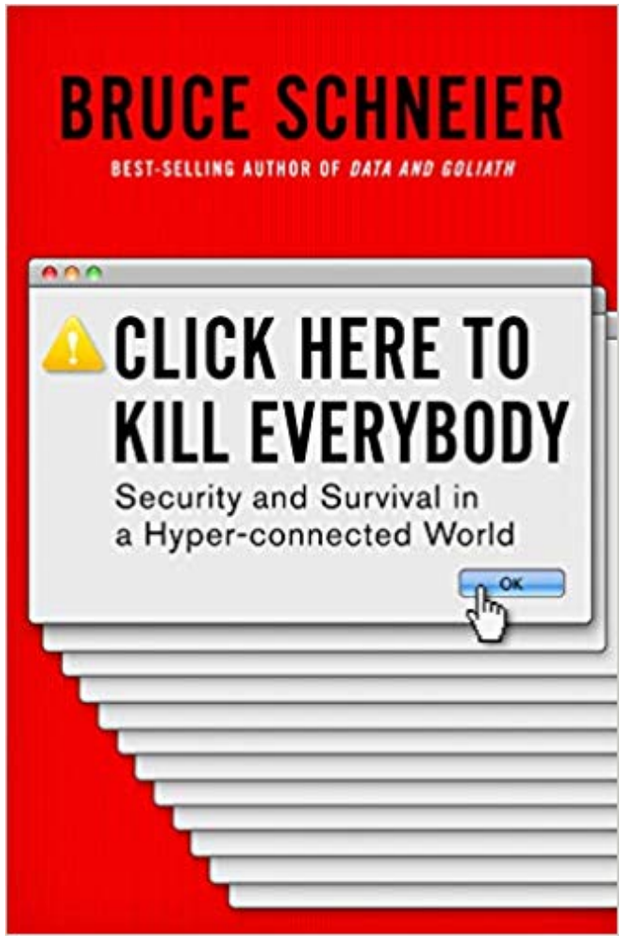
ASUS, one of world's largest computer makers, installed backdoor on thousands of customer computers last yr after hackers compromised its software update tool. The file was signed w/ ASUS digital certificates to make it look like authentic software update.
motherboard.vice.com/en_us/article/…

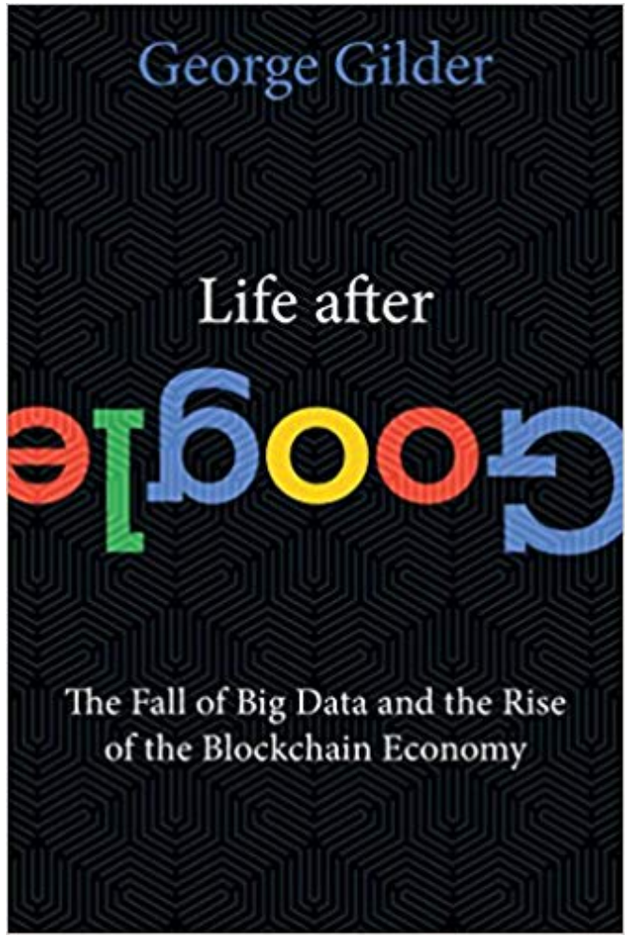
3,031 6:13 AM - Mar 25, 2019

Hackers Hijacked ASUS Software Updates to Install Back…
The Taiwan-based tech giant ASUS is believed to have pushed the malware to hundreds of thousands of customers through its
motherboard.vice.com

3,171 people are talking about this


War, Sabotage,
and Fear
in the Cyber Age
THE PERFECT WEAPON
Author of the New York Times
Bestseller Confront and Conceal
DAVID E. SANGER


BRUCE SCHNEIER
BEST-SELLING AUTHOR OF DATA AND GOLIATH
CLICK HERE TO
KILL EVERYBODY
Security and Survival in
a Hyper-connected World
OK


George Gilder
Life after
Google
The Fall of Big Data and the Rise
of the Blockchain Economy

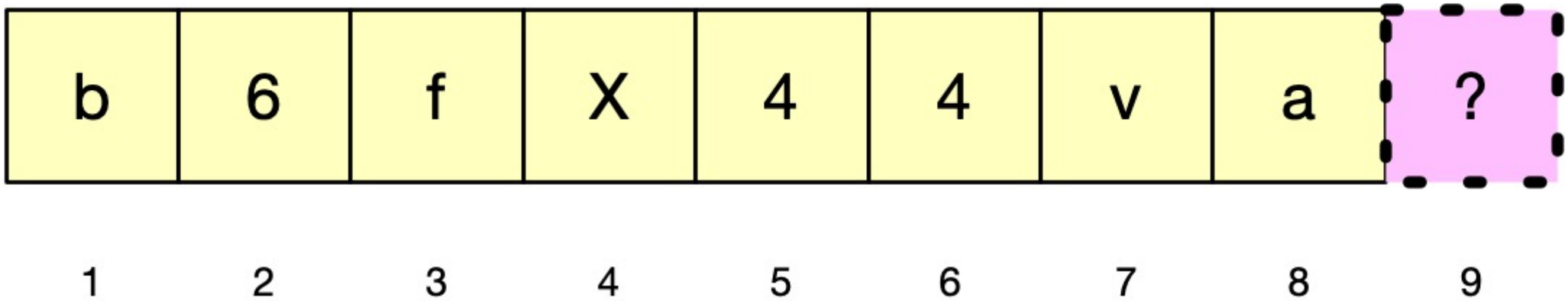
Report RR2299

“Estimating the cost of cyber risk”

Cybercrime has a global cost of $799 billion to $22.5 trillion

Typical Malware Exploit

“Buffer Overflow”



Stanisław Ulam
1909 - 1984

John von Neumann
“Good times Johnny”
1903 - 1957

Why all these attacks?

- Large attack surface
- Complexity
- Attribution
- Skill vs Ability

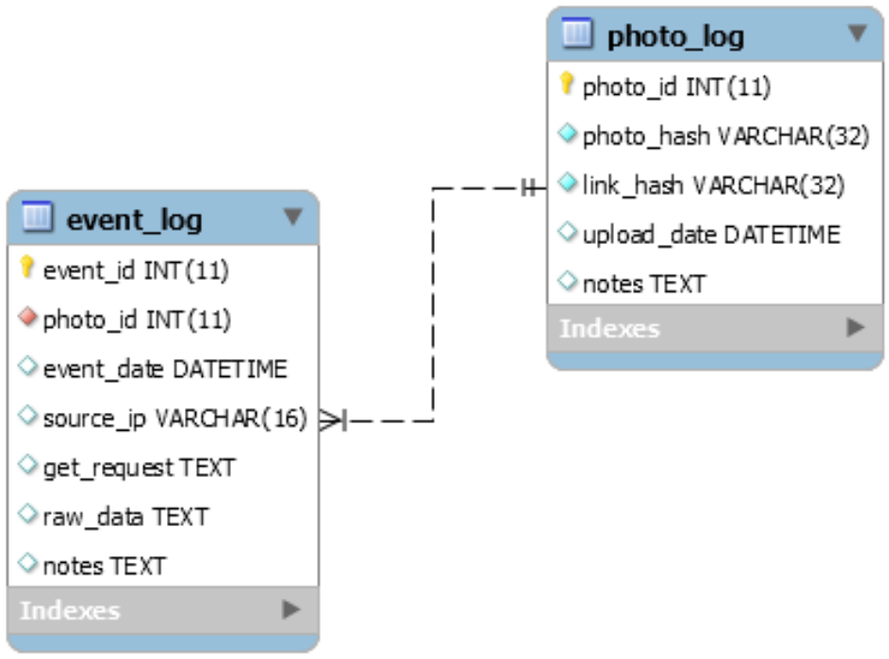
- Small gains
- Skills gap
- Public education

What are the challenges?

(Challenges are opportunities!)

- Scientific foundations
- Software Engineering
- Business, IT & Academia

- Education:
  - Public
  - Workforce
- Compliance: standards, policies and regulations



VirusTotal

AWS

Good news!

Information Security 7 Best Practices
Solves most security issues

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http://prof.msoltys.com