

STEM TREK

Elizabeth Leake | STEM-Trek

HPC Knowledge Meeting 2018

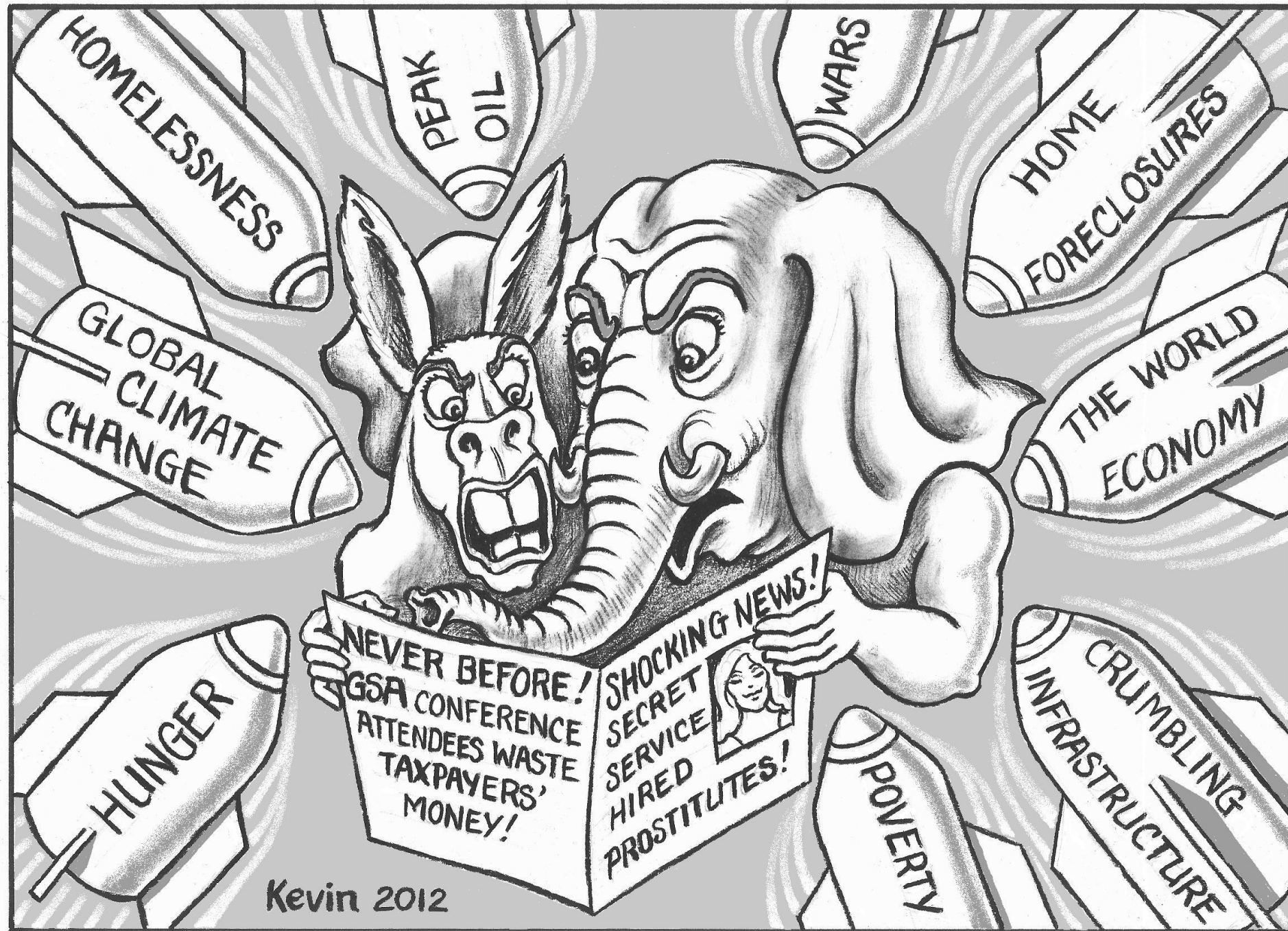
Chasing Unicorns in the Global Gig Economy





STEM-Trek was conceived during a 2010 discussion with TeraGrid Campus Champions about post-9/11 security provisions, and implications for central IT (and travel).





HOMELESSNESS

PEAK OIL

WARS

HOME FORECLOSURES

GLOBAL CLIMATE CHANGE

THE WORLD ECONOMY

HUNGER

NEVER BEFORE!
GSA CONFERENCE
ATTENDEES WASTE
TAXPAYERS'
MONEY!

SHOCKING NEWS!
SECRET
SERVICE
HIRED
PROSTITUTES!



POVERTY

CRUMBLING
INFRASTRUCTURE

Kevin 2012



STEM-TREK/GLOBAL, GRASSROOTS

Won't compete for federal funds.

Crowd-source social capital for travel support, mentors and more.

Pay-it-forward element: beneficiaries are encouraged to help others, or to help STEM-Trek in some meaningful way.

Focus groups:

- Early-career, HPC-Curious scholars from underrepresented groups and regions

Beneficiaries are encouraged to pay-it-forward by helping:

- Veterans
- Workers displaced by automation
- Aging workforce
- People with disabilities



FIVE-YEAR RECIPE FOR FAILURE

- Lone champion secures a grant
- Program built around a machine & funding w/five-year shelf life
- Communications, outreach, education and ER neglected
- Thin: single point of failure
 - No vacation or time to train.
 - Too much to do; won't foster growth.
 - No time for planning or advocacy.
 - Gets burned out.
- Program dies with the machine
 - Local trust & confidence wane.



- Jesse takes a job with a bigger lab where he has back-up, and can have a life again.



provide in their user profiles.

Women

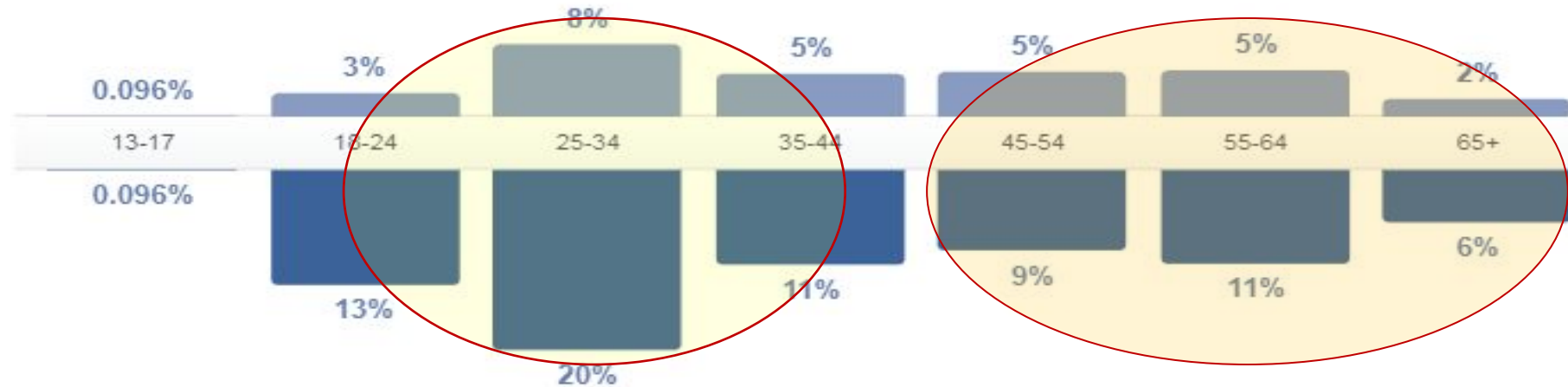
28%
Your Fans

Men

70%
Your Fans

Early career

Late career



Country

Your Fans

City

Your Fans

Language

Your Fans

United States of America

India

South Africa

Germany

United Kingdom

Who is STEM-Trek?

FB: 60 % are 18-44 (70 % male)
Millennials; generation Y
English: US, India and UK



19

Chicago, IL

18

English (US)

771

English (UK)

190

French (France)

12

Spanish

11

Italian

10



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Millennials Higher Education - COMPLETE

No description

by BVK Interactive on 3 February 2016 • 358

Tweet

Popular presentations

See more popular or the latest prezis

BVK Presentation: https://prezi.com/bzkho9dl__d8/millennials-higher-education-complete/#

Gen Y 80 million strong (US)

Born between 1980-2000: Largest generation in American history (bigger than boomers by 6+ million)

Fancy living a healthy lifestyle

Crave adventure

Seek peer affirmation

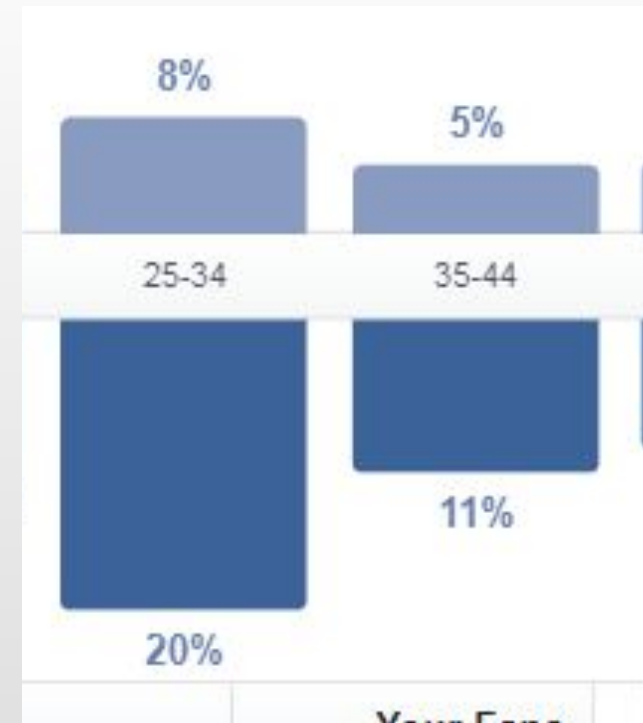
Hooked on social media

Impatient—they want it now

Believe in cause marketing (environment is a priority)

Digital natives (cut their teeth on a joystick)

Job-hopping is normal (3 years expected/91 %)



US grads have an average \$ 37,172K+ in student debt

\$55k in the UK.

Pathological need to be constantly connected to friends & family

BENEFITS OF THE GIG ECONOMY

- Employer
 - Don't have to pay benefits (saves 40 percent)
 - Performance driven
 - Less effort recruiting/vetting
 - Saves time but not necessarily good
- Employee
 - Work from home
 - Can be selective
 - Negotiate price

Began after 2008 crash; corporations pressed to improve bottom line, less spent on employees and benefits; more profits for shareholders.

Intuit study shows by 2020, 40 percent of the workforce will be temporary.

PITFALLS OF THE GIG ECONOMY

- Employer

- High turnover
- Spend more time training
- Less institutional knowledge
 - Things fall through the cracks
 - Thin organization/
weaker internal controls
- Lack of employee loyalty
- Less vetting = more risk

- Employee

- Lack social connections
- More and longer periods of unemployment
- More discrimination (racial, gender, ability, and age bias)
- Uncertainty
 - Fewer buying homes
 - Fewer getting married and starting a family
 - Living with parents longer/delays their retirement
 - Don't feel appreciated/
lack of loyalty

Y IS THE ANXIOUS GENERATION

- Humans are social creatures/can't establish strong relational bonds when you move around a lot
- Loneliness & Depression
- Low self-confidence (difficult to negotiate gig rates effectively)
- Opioid epidemic, most related deaths 23-41
- Increased number of incarcerations highest of any age group 23-41 (criminal)
- Joel Stein (supported by data), calls it the "ME" generation (entitled, lazy, selfish, shallow, narcissistic, fame-obsessed).
- They see themselves in a positive light (tech-savvy, innovative, cool, hip, etc.).

THERE ARE NO UNICORNS...

- In the past, when someone worked long-term for an organization, they developed a breadth of institutional knowledge; they were the unicorns, or “Wizard of Oz.”
- It has become difficult to find temporary or full-time employees with the right skills
- HPC sysadmins
- Data Science
- Science communicators
- Tech outreach

CASE STUDY: SOUTH AFRICAN HPC ENGINEER

- Unicorn 9-year veteran (once a grad)
- CSIR talent search/recruitment extended twice over a two-month period, but only drew three applications
- No ready-made unicorns applied

STEM-TREK OFFERED TO HELP

- Produced a blog
 - 15,500+ STEM-Trek, re-Tweeted by HPCwire to 11.4k followers
- Marketed to Millennials (subliminal) 
- Pull vs. Push
 - HR used traditional watering hole
 - STEM-Trek broadcast to global community of prospects
 - Targeted new communities in Cape Town (industry HPC)

STEM-Trek News



SEARCH STEM-TREK

Search...

STEM-TREK

Yes! Women should apply, too

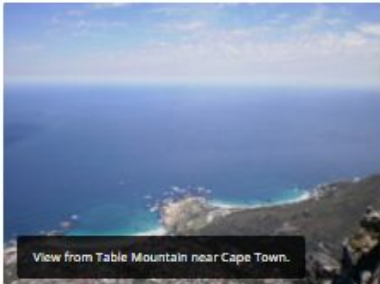
Appeals to the competitive

Do you have what it takes to be a CHPC Engineer? If so, apply by March 11!

On March 3, 2016 | By Stem Trek | With No Comments

The South African Center for High Performance Computing (CHPC) is looking for an HPC Engineer with five years of relevant experience, and a combination of soft and technical skills. The successful candidate will be a front-row participant in the lives of many and a chance to work with an amazing team!

Appeals to their sense of adventure



View from Table Mountain near Cape Town.

As you may have heard, HPC industry eyes are on South Africa as exascale's likely birthplace. With the Square Kilometer Array (SKA) being built in the great Karoo region, implications for SA and the HPC industry have captured the attention of

- Approved
- Free or low-cost HPC training
- News & Events
- Preparing for Exascale in South Africa @ the 2015 CHPC National Meeting
- ... for the
- Institute
- Home
- Participate
 - Leadership
 - Elizabeth Leake, Founder and President
 - David Stack, Vice President and Adviser
 - Diane Baxter, Education Adviser
 - Organization Documents

With only a few years left to prepare for SKA, CHPC is expanding their portfolio with the addition of a new petascale system.

The HPC Engineer would be a key team member in the planning of their annual national meeting. This is a significant challenge. You will be part of a student team working on a project at the International Supercomputing Conference in 2013 & 2014.

Geek's need to know what they're in for.

Their annual national meetings feature in-depth data science and network infrastructure content, in addition to the traditional HPC tutorials, workshops, plenaries, and student programs. Plus, they're held in phenomenal venues. The 2016 conference will be in beautiful East London, and in 2014 it was at Kruger National Park, a game reserve the size of New Jersey where people are in cages and animals run free.

If the successful candidate doesn't already live in Cape Town, CSIR will support relocation expenses (even if they don't live on the continent). Plus, the job offers 25 paid vacation days each year.

If I were qualified, I wouldn't be posting this—I would be applying before the March 11 deadline!



Elizabeth Leake, Founder and President

I would apply if I could—you should, if you are qualified!

Position Details:

The South African Council for Scientific and Industrial Research (CSIR) has a vacancy for a High Performance Computing (HPC) Engineer. The successful candidate will be responsible to fulfill a significant role in the development of HPC technologies, both hardware and software, and to assess its performance and suitability for use in production HPC environments. In addition, the candidate

If you don't love training, don't apply

CHPC's New System Features:

Dell PowerEdge C6320 servers:

- Standard compute nodes 128 GB/node
- 2x Intel Xeon e5-2690 v3 (Haswell) processors
- 23 cores each; 24 cores/node

Dell PowerEdge R930 servers:

- Large memory compute nodes; 1024 GB /node (fat nodes)
- 4x Intel Xeon E7 4850 v3 processors
- 14 cores each; 56 cores/node
- InfiniBand FDR 2:1 blocking 56 GBPS
- Parallel storage (usable) PB

Total number of racks (including compute NLogin management and storage nodes):

- 6 in Phase 1 and 19 in Phase 2
- Centos 7.1 with Bright* cluster management

Total expected LINPACK compute (TFLOPS):

- 774.5 in Phase 1, and 1000 Phase 2 (April, 2016)



The 2015 Student Cluster Challenge Winners will travel to Germany to compete in the International SCC this summer.

22 QUALIFIED APPLICATIONS
RECEIVED IN 8 DAYS!

Recruit and Retain Millennial Unicorns

Remember, they can often earn twice as much elsewhere

Offer a sense of security, avoid soft money if you can

Expedite the HR process. Avoid bottlenecks!

Ample vacation time, and back-up so they can take it

Childcare and generous maternity leave

Flexible work options (home)

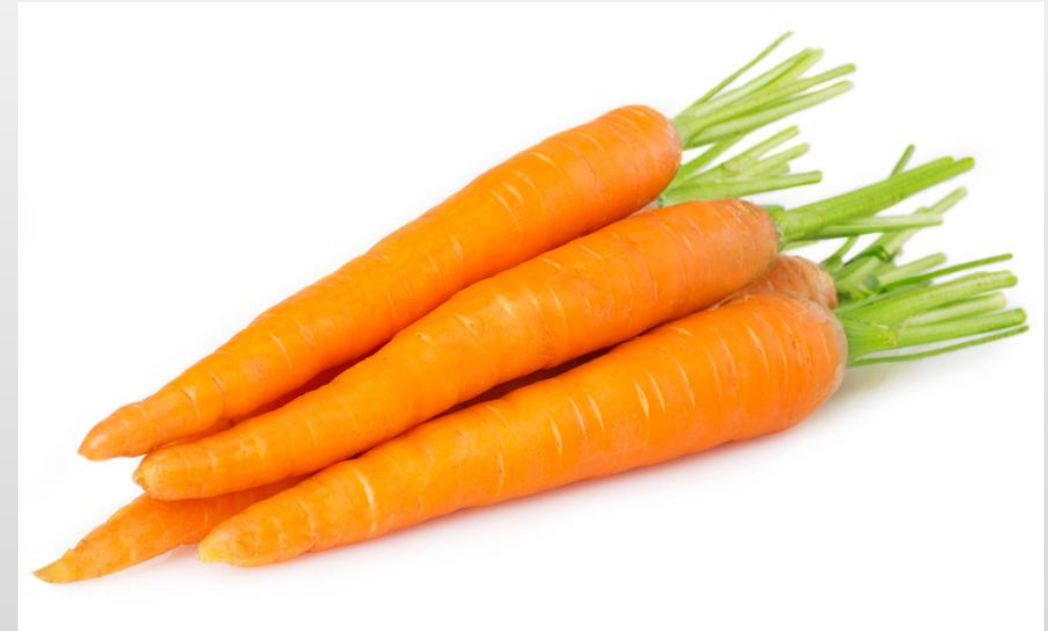
Peer recognition: Employee of the month

Free gym membership (family) and time to exercise

Support professional development, travel & conferencing

Encourage and reward civic involvement (cause marketing)

Facilitate the pursuit of and/or completion of advanced degree



DO YOU REALLY NEED A UNICORN?

- If you have strong back-end tech talent, think about augmenting the front-end with soft skills, and cross-train

- ✓ Cheaper
- ✓ Diverse
- ✓ Abundant



WHERE TO FIND PROSPECTS

- Grow your own
 - Student cluster competitions
- Look under the “Long Tail”
- HPC communicators can be from underrepresented disciplines more diverse / stellar soft skills.
 - Arts & Humanities
 - Social Science (XSEDE Jetstream)
 - Economics
- Cherry-pick from another silo (LinkedIn)
 - Journalism and Communications Academic Depts.
 - Public Affairs/University Relations
 - Displaced journalists can be retrained



50 percent of prospects

50 percent of your potential

Make the workplace more comfortable for women

NOT
COOL
OR
FUNNY



Tech companies in China are hiring "programming cheerleaders". Girls that cheer up the programmers as they work.

Rural-TechTopia, anyone?



By Elizabeth Leake, STEM-Trek

When I founded STEM-Trek, I began to investigate why economies everywhere had begun to unravel. I became even more convinced that we need a stronger support system for our focus groups, including STEM (science, technology, engineering, and mathematics) scholars, veterans and the aging workforce. While volunteer work through STEM-Trek has taken me to sub-Saharan Africa where communities have always struggled, it has been especially difficult to watch conditions deteriorate in what was once my idyllic home town, Lincoln, Illinois-U.S. You might say it's the heart of the heartland.

Subtle changes to a town are more obvious to people who move away, and return for holidays. For me, trips home have been infrequent since my parents passed away, but I'm returning in a

TechTopia

Well-wired living, laboratory, education, training, and recreational community that offers technical & psycho-social support for rural, home-based, high-tech workers.

Recreational, fitness and cultural options improve the quality of life for residents and their families, while creating a weekend destination for people from nearby cities (vs. the other way around).

ONE PERCENT = PSYCHOPATHS

- **Not all are criminals, but many criminals are**
- **Red flags** to watch for when hiring or promoting
 - Charming (skilled at impression management/inconsistent with subordinates).
 - Lack empathy (ruthless high-achievers)
 - Rationalize misconduct (blame others; failure is never their fault)
 - Street-level and white-collar wired the same; seek opportunities to exploit
- 25 percent incarcerated in federal corrections facilities are psychopaths
- Orgs with weak internal controls likely to have more than one percent
 - Those with traits gravitate to and are promoted within
 - They hire others who can be manipulated and/or also possess the traits
 - They will seek to normalize fraud in order to establish a culture of misconduct

ENTERPRISE RISK

- White-collar crime is “socially-acceptable” and rarely punished
 - When discovered, employee is pressured to quit so there is no mitigation; no record.
- Lack of loyalty in gig economy (prevailing attitude that others deserve to be mistreated)
- Tight budgets thin staff = Weak internal controls
- Hire/fire to satisfy selfish needs (intimidated by would-be whistle-blowers, or that would outshine them)
- Fraud could be intentional or via negligence
- Stakes are higher than ever (costly in terms of penalties and might take years to discover)
 - Nefarious use or sale of computational power (intentional or neglect)
 - Intellectual property sold and/or orchestrated data breach
 - They might buy hardware or software for illegal purposes, or personal use
 - Misuse decommissioned hardware
 - Set up a Bitcoin mining operation in the closet (excessive power bills/institution's liability)
 - Serve-up copyright protected media; university subject to liability

HIGH PERFORMANCE COMPUTING

MODERN SYSTEMS AND PRACTICES

THOMAS STERLING, MATTHEW ANDERSON,
MACIEJ BRODOWICZ

MK
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FOREWORD BY C. GORDON BELL

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