




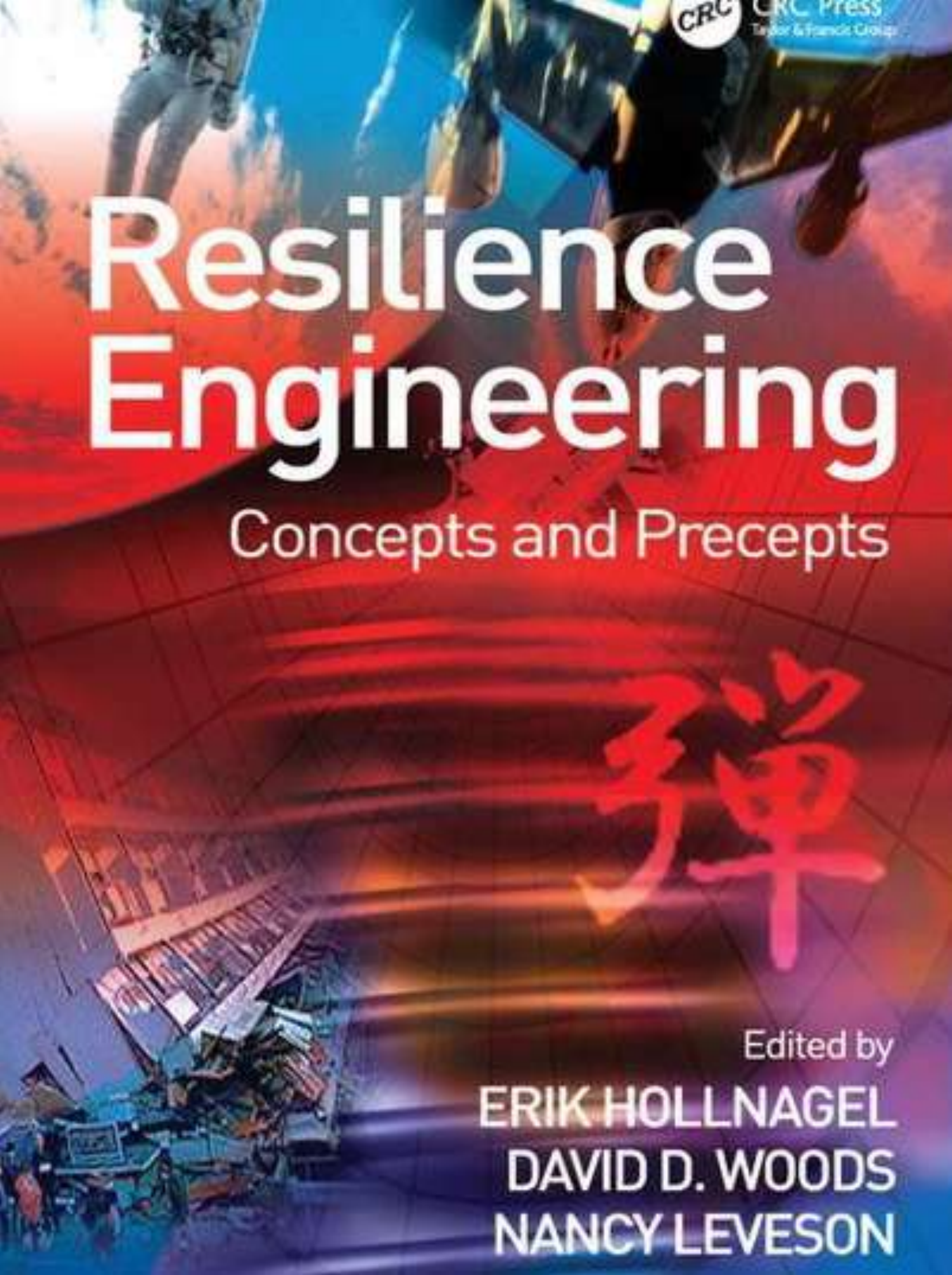
THE HALO OF RESILIENCE ENGINEERING

J. PAUL REED, SENIOR APPLIED RESILIENCE ENGINEER, **NETFLIX**
FAILOVER CONF, 2020

J. PAUL REED

- ▶ @jpaulreed on 
- ▶ Alumn of **The Ship Show**
- ▶ 20 Years in **Build / Release Engineering**
- ▶ **Senior Applied Resilience Engineer** on Netflix's
**Critical
Operations &
Reliability
Engineering team**
- ▶ MSc, **Human Factors and Systems Safety**:
jpaulreed.com/thesis





Resilience Engineering

Concepts and Precepts

Edited by
ERIK HOLLNAGEL
DAVID D. WOODS
NANCY LEVESON

“RESILIENCE”
“ENGINEERING?”

Resilience Engineering

Concepts and Precepts

Edited by

Erik Hollnagel, David D. Woods

and

Nancy Leveson

“RESILIENCE” “ENGINEERING?”

E_TOO_MANY_Rs

Robustness

Reliability

Resilience

Resiliency

Rebound

E_TOO_MANY_Rs

Robustness

Reliability

Resilience

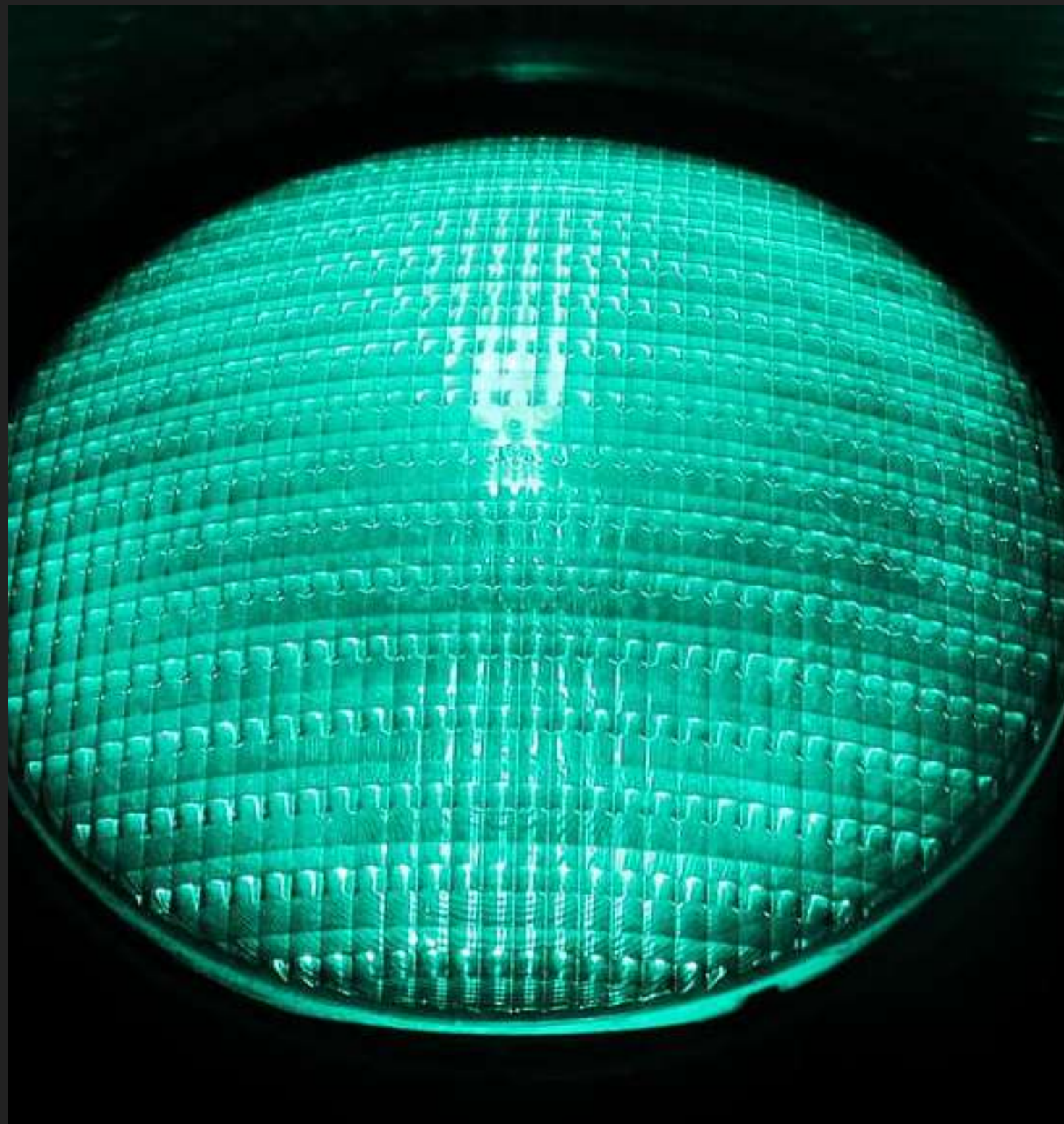
Resiliency



Rebound

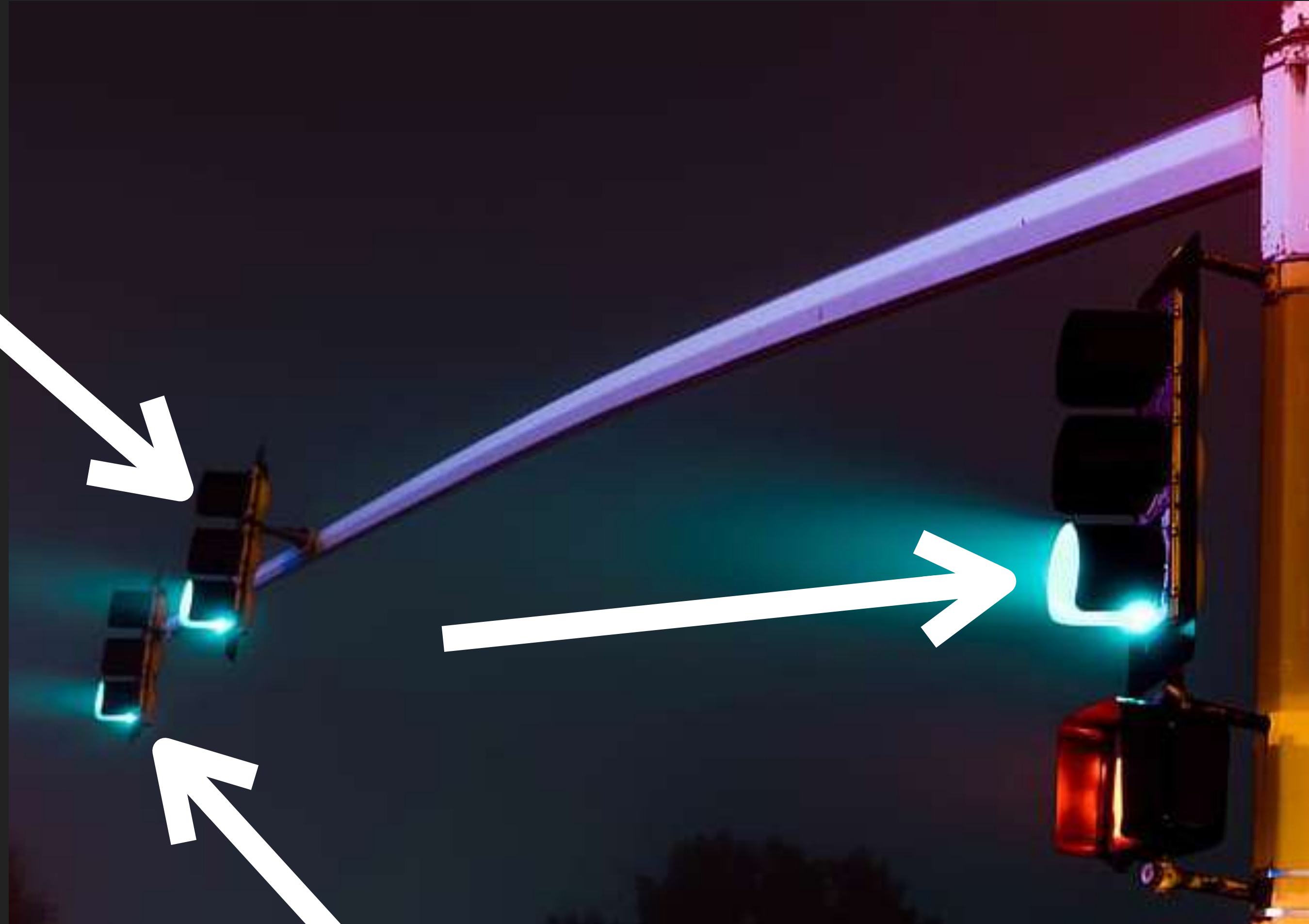


“ROBUSTNESS”



Incandescent versus LED Lights

“RELIABILITY”



“REBOUND”



vs.



“RESILIENCE”



“For the last 45 minutes, **this man** has kept [this New York City] intersection alive.”

“RESILIENCE”



Alex Elman
@_pkill



LED arrays instead of bulbs is an example of robustness in traffic safety. This New Yorker is an example of resilience.

10:40 PM · Jul 14, 2019 · [Twitter for iPhone](#)

2 Retweets **7** Likes



RESILIENCE ISN'T
SOMETHING YOU HAVE,
IT'S *SOMETHING YOU DO.*

Dr. David Woods*

BEWARE THE IDES OF MARCH...

San Francisco Chronicle

Coronavirus order: Gov. Gavin Newsom tells Californians to stay at home

Alexei Koseff and Erin Allday | March 19, 2020 | Updated: March 19, 2020 9:28 p.m.

The New York Times

One in Five Americans Ordered to Stay Home in Coronavirus Crackdown

Strict new directives in New York, California, Illinois and other states were intended to slow the spread of the coronavirus.



Coronavirus impact: How the COVID-19 shut down the sports world in just 43 hours

abc 7
Friday, March 13, 2020



Delivery worker riding down Nostrand Avenue in Brooklyn on Friday. Demetrius Freeman for The New York Times

ADAPTIVE CAPACITY

- ▶ How **unique** are the interventions?
- ▶ How **small** can they be and still maintain effectiveness?
- ▶ How **quickly** can we modify them?
- ▶ Are there appropriate **signaling mechanisms** in place?



ADAPTIVE CAPACITY MARATHON, NOT ADAPTIVE CAPACITY RACE



INTERRUPTEUR D'URGENCE

BARAQUE D

NIVEAU 1.2 & 3

EMERGENCY STOP



AN INTERESTING QUESTION

During this once-in-a-century *global pandemic*,
do you stop deploying?

ASKING THE WRONG QUESTION

**"Ends"
of the
Socio-technical
System**

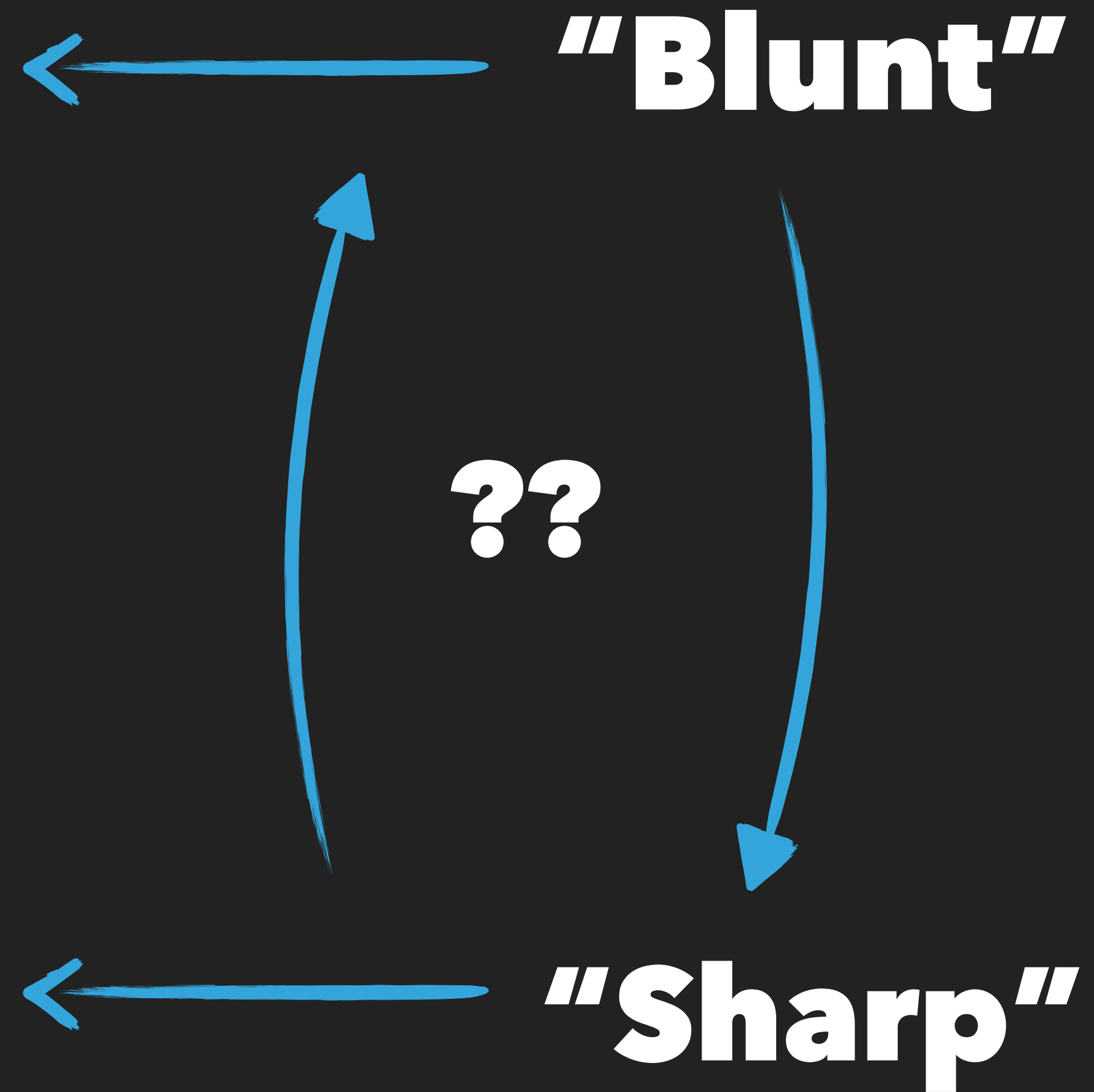


← **"Blunt"**

← **"Sharp"**

ASKING THE WRONG QUESTION

- Where is the **idea** coming from?
- Where is **pressure** being applied?



SO WHAT NOW?

COPING WITH COGNITIVE LOAD IMPACT

- ▶ Shed load
- ▶ Trade off **thoroughness** in each task
- ▶ Shift work in time
- ▶ Recruit more **resources**

COPING WITH TEAM IMPACT: “COMMON GROUND”

- ▶ Basic Compact
- ▶ Goal Alignment and Commitment
- ▶ Interpredictability
- ▶ Sustain and Repair

ONE MORE THING...



Rich Burroughs @richburroughs · Aug 23, 2018

My favorite person who makes me scared to fly, @jpaulreed
#SensuSummit



Corey Quinn
@QuinnyPig

One of the real victims of this pandemic is @jpaulreed. Air travel is way down, and now he'll have nothing to give conference talks about.

3:27 PM · Apr 15, 2020 · Drafts

13 Likes



**STAY SAFE.
STAY HEALTHY.
STAY RESILIENT.**

J. PAUL REED
@JPAULREED
FAILOVER CONF, 2020