CODING FAST AND SLOW

Applying Kahneman's Insights to Improve Development Practices and Efficiency

PROF. DANIEL KAHNEMAN

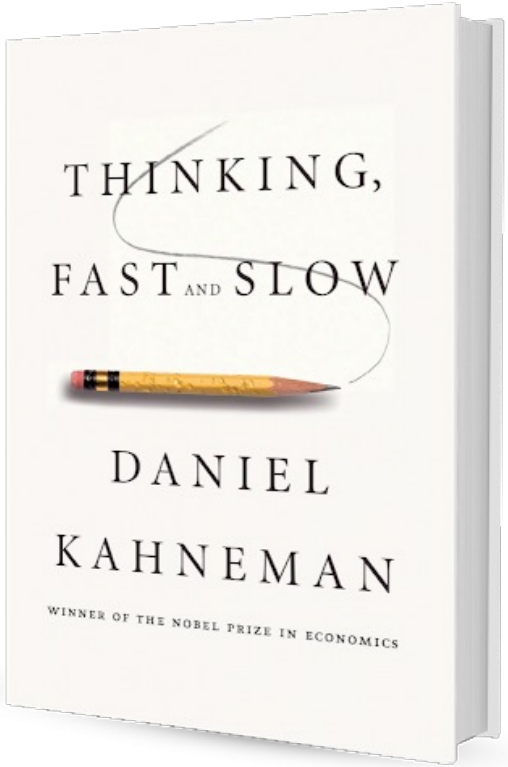
Mar 5, 1934 – Mar 27, 2024

2002 NOBEL PRIZE LAURATE IN ECONOMICS!

"FOR HAVING INTEGRATED INSIGHTS FROM PSYCHOLOGICAL RESEARCH INTO ECONOMIC SCIENCE, ESPECIALLY CONCERNING HUMAN JUDGMENT AND DECISION-MAKING UNDER UNCERTAINTY"

ECONOMICS?

- ECON101: People are rational; that's why markets work.
- – Nope, they aren't; here's 50 years of study.
- – Oh, wow, they really aren't. It probably has a profound effect on economics! Here's a Nobel Prize for ya!
- ECON101: People are rational; that's why markets work.


THINKING,
FAST AND SLOW
DANIEL
KAHNEMAN
WINNER OF THE NOBEL PRIZE IN ECONOMICS

A BAT AND A BALL COST $1.10 IN TOTAL.

THE BAT COSTS $1 MORE THAN THE BALL.

HOW MUCH DOES THE BALL COST?

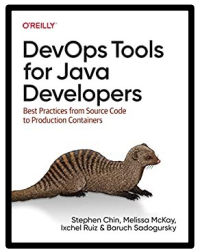
HOW MUCH DOES THE BALL COST?

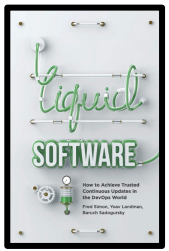
0.10 + (1.00+0.10) = 1.20

0.05 + (1.00+0.05) = 1.10

Baruch Sadogursky - @jbaruch

- Developer Productivity Advocate
- Gradle Inc
- Development -> DevOps -> #DPE



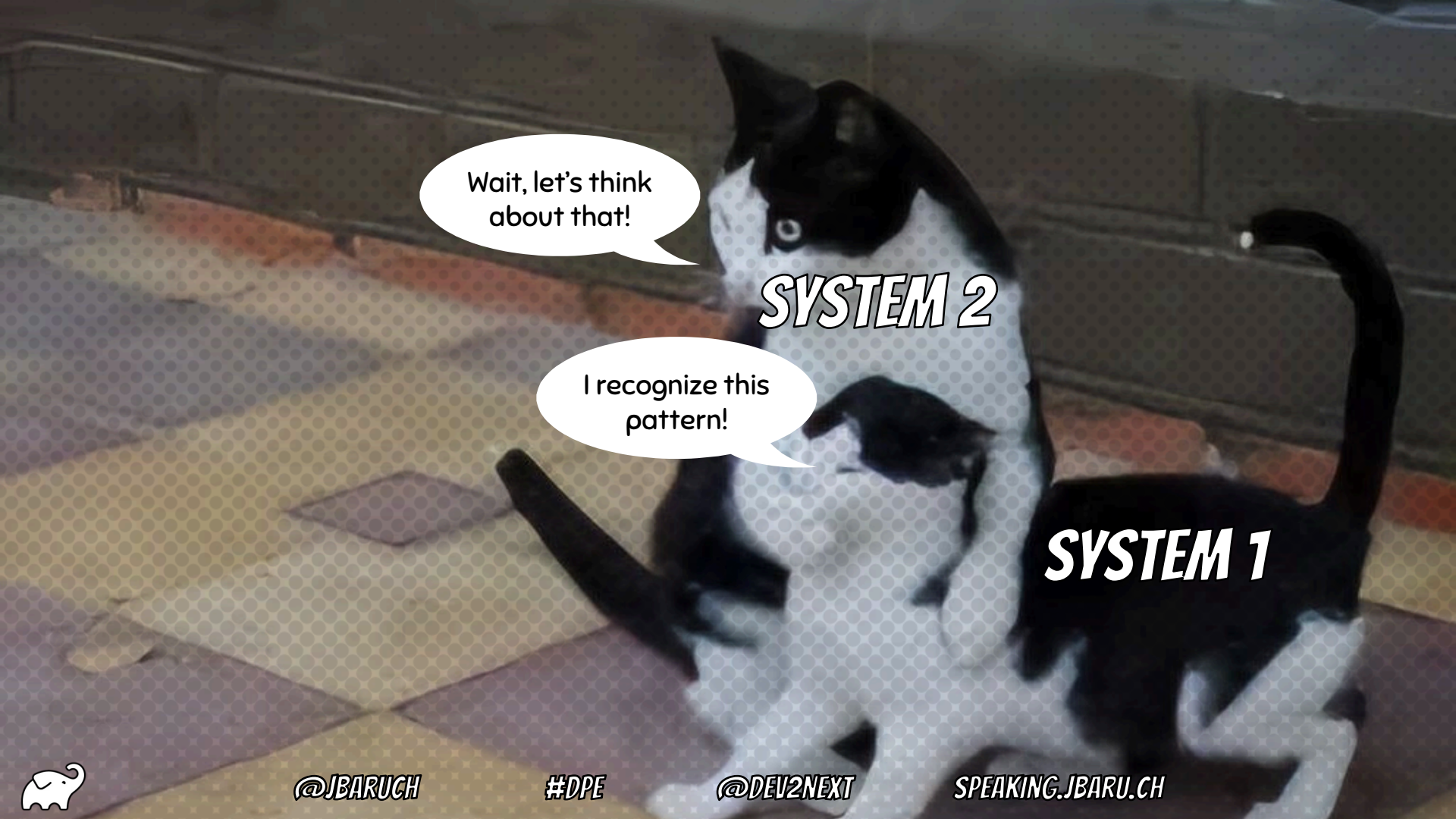


SHOWNOTES

- speaking.jbaru.ch
- Slides
- Video
- All the links!

TWO SYSTEMS

SYSTEM ONE	x Fast x Intuitive x Automatic x Emotional x Cheap and eager
SYSTEM TWO	x Slow x Analytical x Controlled x Logical x Expensive and lazy


Wait, let's think about that!
SYSTEM 2
I recognize this pattern!
SYSTEM 1
@JBARUCH
#DPE
@DEV2NEXT
SPEAKING.JBARU.CH

```
class UniqueWords {
    public static void main(String[] args) throws IOException {
        if (args.length != 1) {
            throw new IllegalArgumentException("Invalid argument");
        }
        Set<String> words = new HashSet<>();
        for (String line : Files.readAllLines(Path.of(args[0]))) {
            // Ignore commented lines
            if (!line.startsWith("#") || !line.startsWith("//")) {
                Collections.addAll(words, line.split("\\W+"));
            }
        }
        System.out.println("Count of unique words: " + words.size());
    }
}
```

RED

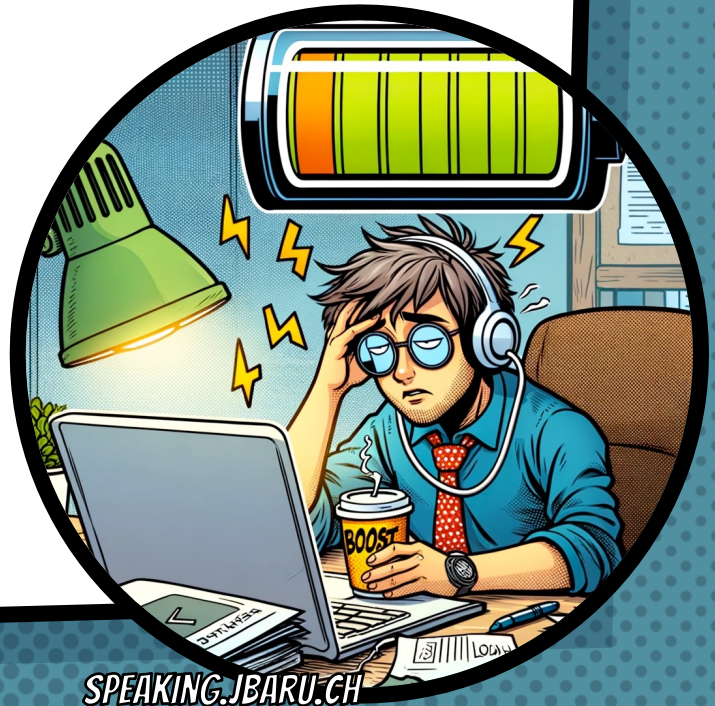
GREEN

YELLOW

BROWN

ORANGE

YOU HAVE "MENTAL FUEL"



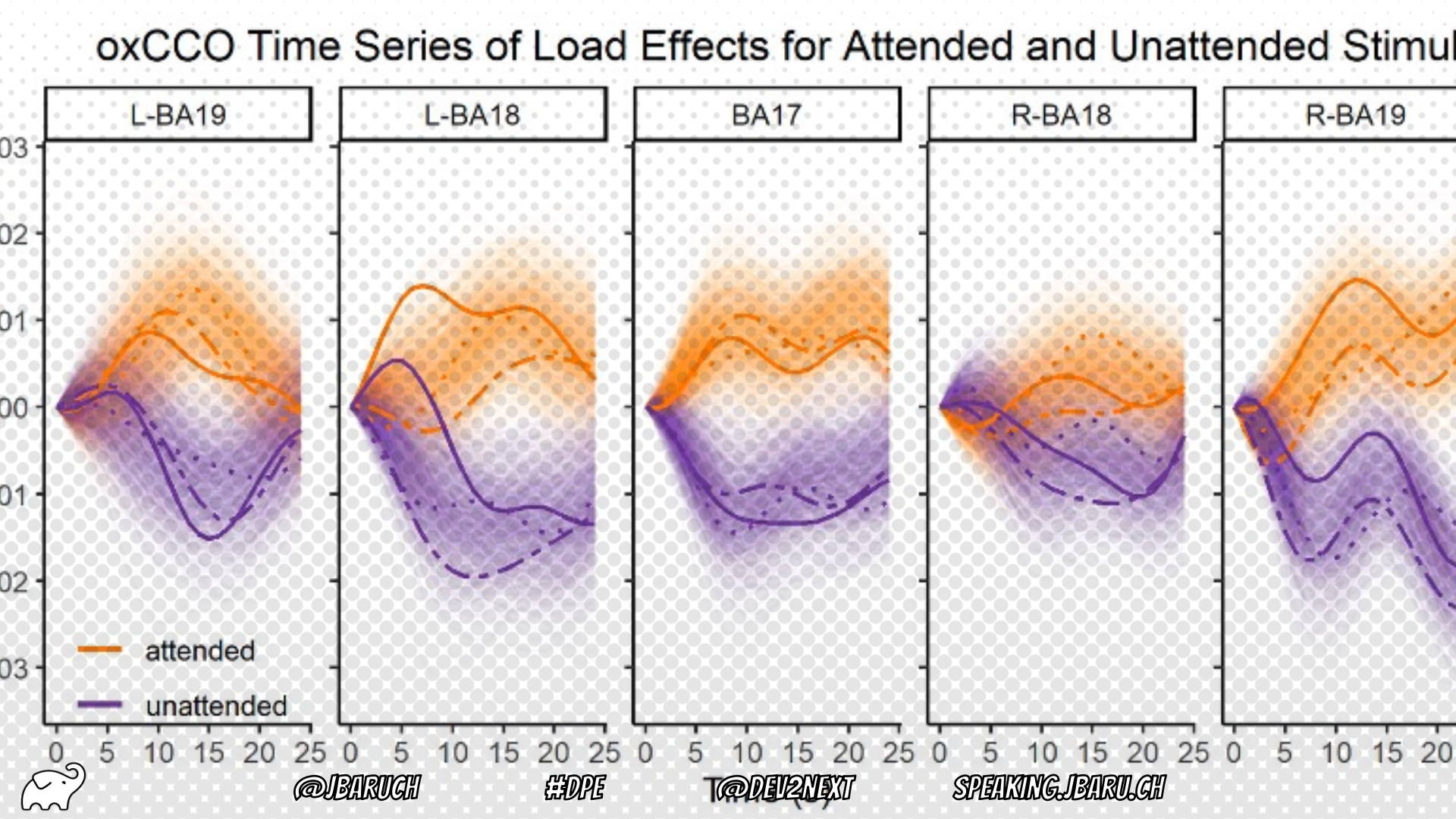
The Journal of Neuroscience, August 26, 2020 • 40(35):6801–6811 • 6801

Behavioral/Cognitive

Attention and Capacity Limits in Perception: A Cellular Metabolism Account

Merit Bruckmaier,[1] Ilias Tachtsidis,[2] Phong Phan,[2] and Nilli Lavie[1]
[1]Institute of Cognitive Neuroscience, University College London, London WC1N 3AZ, United Kingdom, and [2]Department of Medical Physics and Biomedical Engineering, University College London, London WC1E 7JE, United Kingdom

@JBARUCH #DPE @DEV2NEXT SPEAKING.JBARU.CH


oxCCO Time Series of Load Effects for Attended and Unattended Stimul
L-BA19
L-BA18
BA17
R-BA18
R-BA19
attended
unattended
0 5 10 15 20 25
@JBARUCH
#DPE
@DEV2NEXT
SPEAKING.JBARU.CH

Explain the paper "Attention and Capacity Limits in Perception: A Cellular Metabolism Account" to me Barney-style in one paragraph or less.

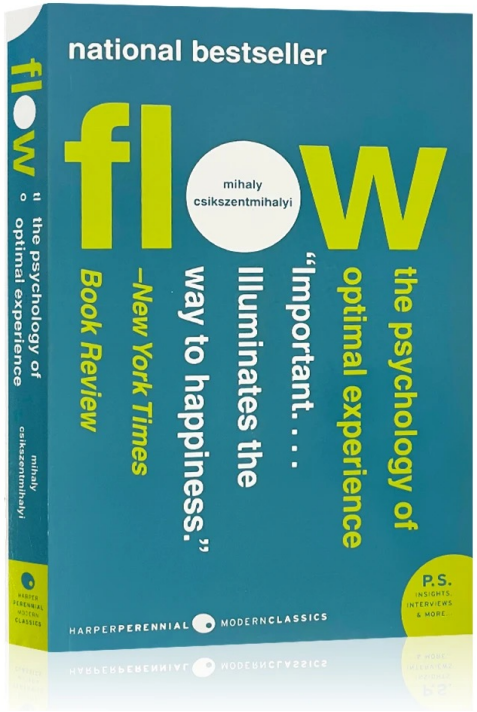
Attention and Capacity Limits in Perception: A Cellular Metabolism Account

- BNIRS and oxCCO
- Cellular Metabolism as Mental Fuel
- Finite Energy Supply
- High Load Mode vs Low Load Mode

WHICH SYSTEM DO WE USE FOR CODING?

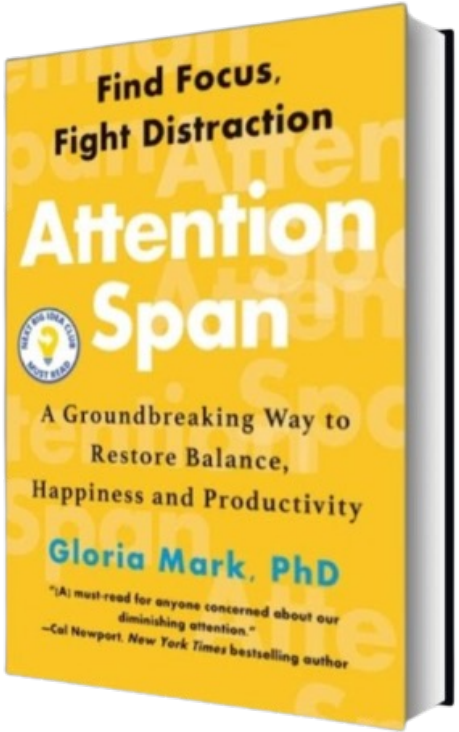
SYSTEM ONE	x Fast x Intuitive x Automatic x Emotional x Cheap and Eager
SYSTEM TWO	x Slow x Analytical x Controlled x Logical x Expensive and Lazy

SOFTWARE ENGINEERING


national bestseller
flow
mihaly csikszentmihalyi
the psychology of optimal experience
"Important. . . . Illuminates the way to happiness."
–New York Times Book Review
P.S. INSIGHTS, INTERVIEWS & MORE...
HARPERPERENNIAL MODERNCLASSICS

"STATE OF **EFFORTLESS** CONCENTRATION SO DEEP THAT PEOPLE LOSE THEIR SENSE OF TIME, THEMSELVES, AND THEIR PROBLEMS"

ATTENTION CONTROL IS EXPENSIVE


Find Focus,
Fight Distraction
Attention
Span
A Groundbreaking Way to
Restore Balance,
Happiness and Productivity
Gloria Mark, PhD
"[A] must-read for anyone concerned about our diminishing attention."
—Cal Newport, New York Times bestselling author

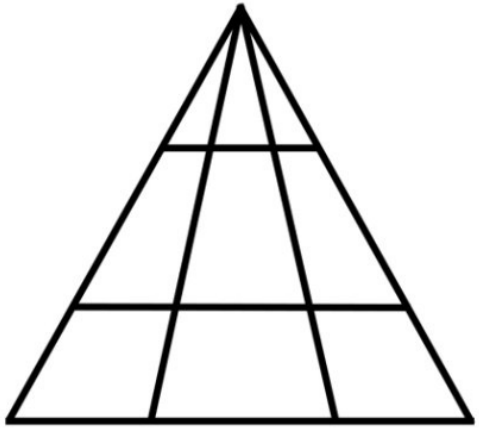
Is email stealing your focus?
The average person checks their email
77 times a day.

Our attention span has dwindled
to about 47 SECONDS
on any screen.

It takes 25 minutes to return focus
to a task after interruption.

```java
public class DiscountCalculator {
    public static void main(String[] args) {
        calculateDiscount(100, 15);
    }

    public static void calculateDiscount(double price, double discount) {
        double finalPrice = price - (price * discount / 100);
        System.out.println("The final price after a " + discount + "%
discount is: " + finalPrice);
    }
}
```



HOW MANY TRIANGLES?

```java
public class TaxCalculator {
    public static void main(String[] args) {
        calculateTax(100, 5);
    }

    public static void calculateTax(double amount, double taxRate) {
        double totalAmount = amount + (amount * taxRate);
        System.out.println("The total amount with tax: " + totalAmount);
    }
}
```

THE PROBLEM:

- × You deplete your fuel by context-switching
- × You're not in the flow because of context-switching
- × Loose-loose: you need more fuel needed, but you have less fuel

2017 IEEE/ACM 2nd International Workshop on Emotion Awareness in Software Engineering (SEmotion)

Characterizing and Predicting Mental Fatigue during Programming Tasks

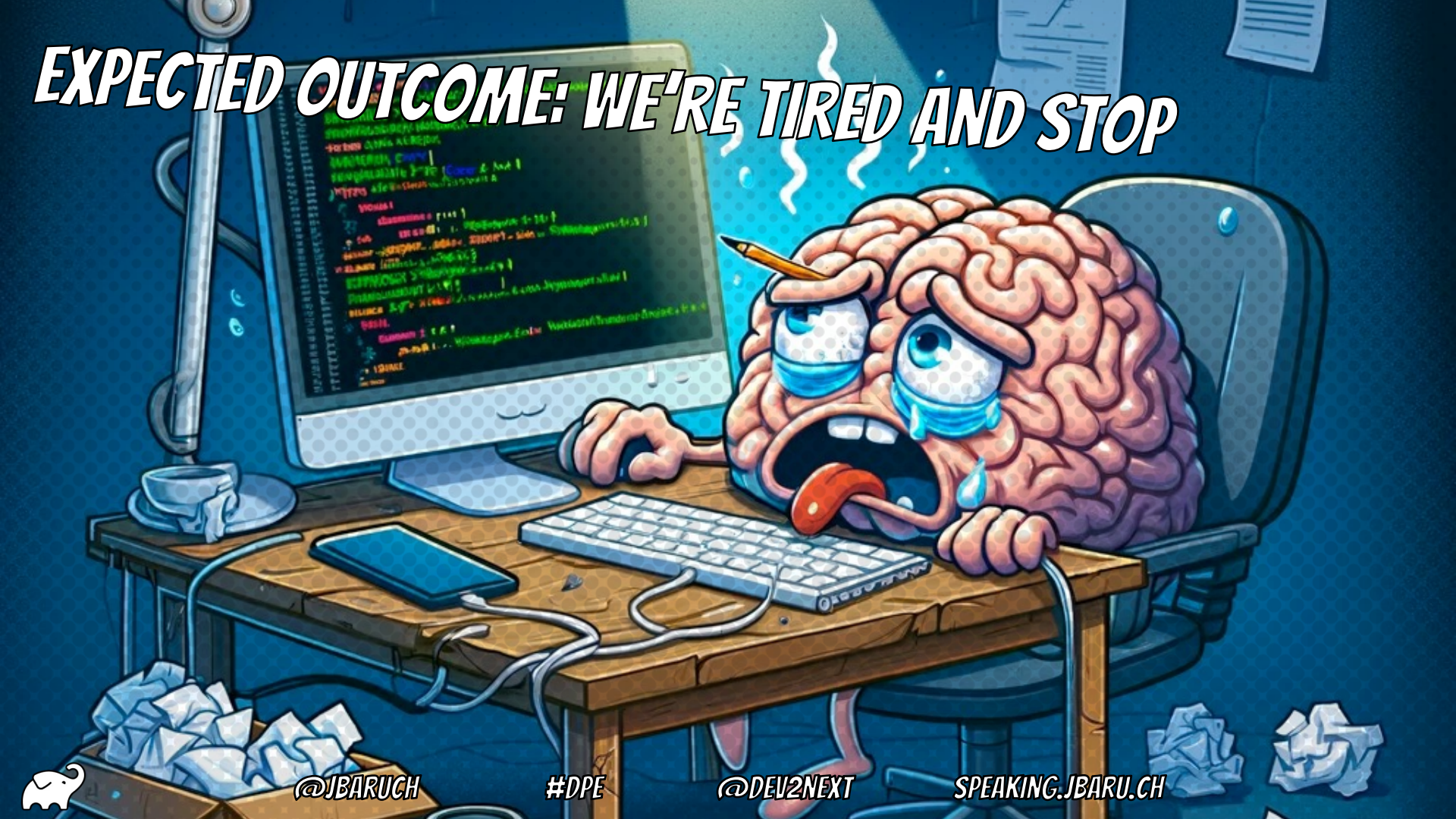
Saurabh Sarkar
Microsoft
Redmond, WA, USA
Email: saurabsa@microsoft.com

Chris Parnin
North Carolina State University
Department of Computer Science Raleigh, NC, USA
Email: cjparnin@ncsu.edu

When we are tired, we produce worse code

- "Developers are cutting corners on quality when fatigued."

(duh)


EXPECTED OUTCOME: WE'RE TIRED AND STOP
@JBARUCH
#DPE
@DEV2NEXT
SPEAKING.JBARU.CH

But we don't know when to quit

- × Default parole decision: deny
- × Fewer paroles when judges are tired/hungry
- × Granting parole needs System 2 thinking
- × Judges unaware of switching to System 1

Real-life outcome: you run on System One

System One	x Fast x Intuitive x Automatic x Emotional x Cheap and Eager
System Two	x Slow x Analytical x Controlled x Logical x Expensive and Lazy

"OK code"


@JBARUCH
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SPEAKING.JBARU.CH

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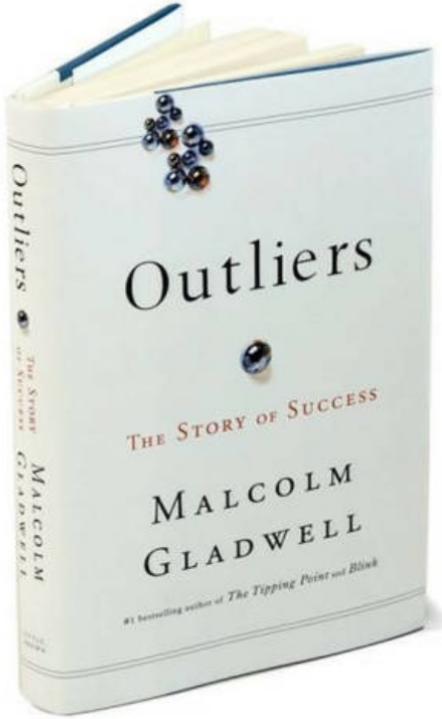
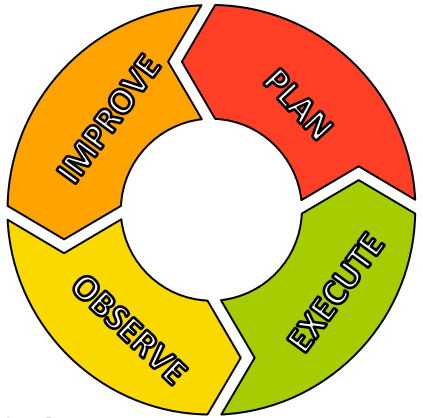
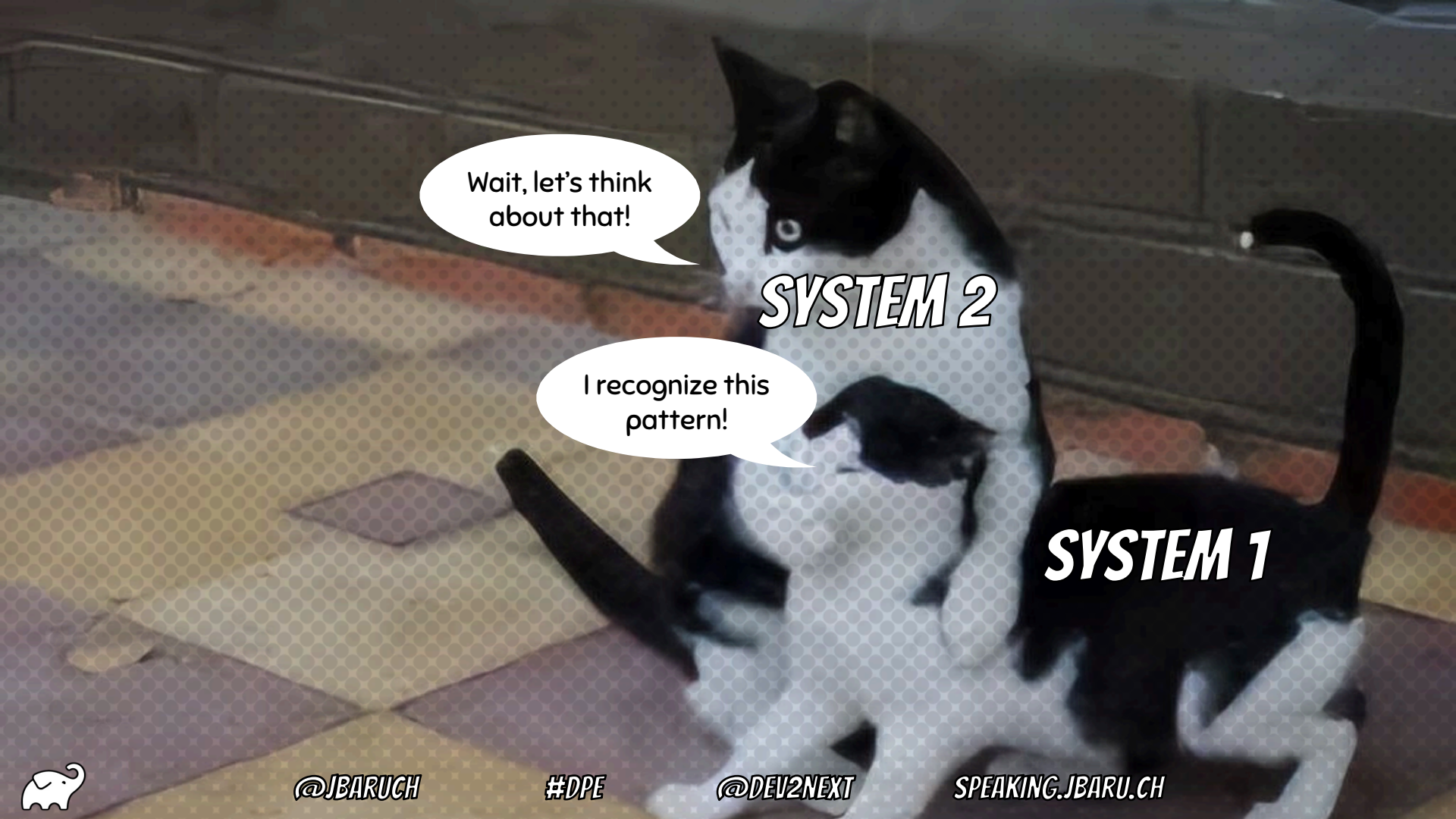
"EXECUTE SKILLED RESPONSES AND GENERATE SKILLED INTUITIONS AFTER ADEQUATE TRAINING"


Outliers
The Story of Success
Malcolm Gladwell
#1 bestselling author of The Tipping Point and Blink
Outliers
The Story of Success
Malcolm Gladwell

10,000 hours of practice move some system 2 activities to system 1

- Driving
- Golf
- Tennis
- Music playing
- Safety drills for fire fighters

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SPEAKING.JBARU.CH

Real-life outcome: you run on System One

System One	x Fast x Intuitive x Automatic x Emotional x Cheap and Eager
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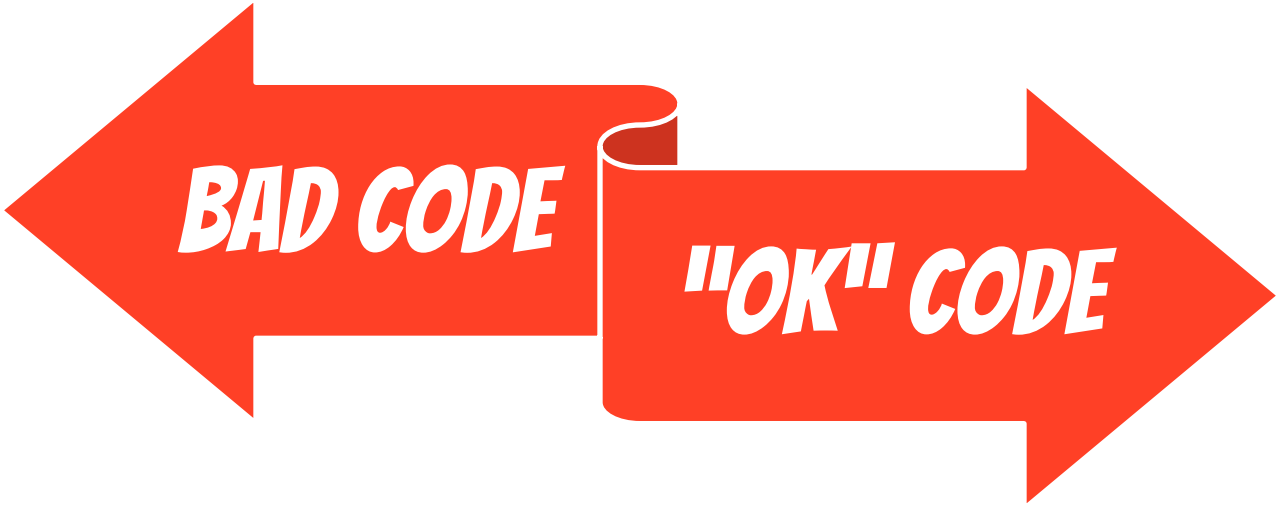
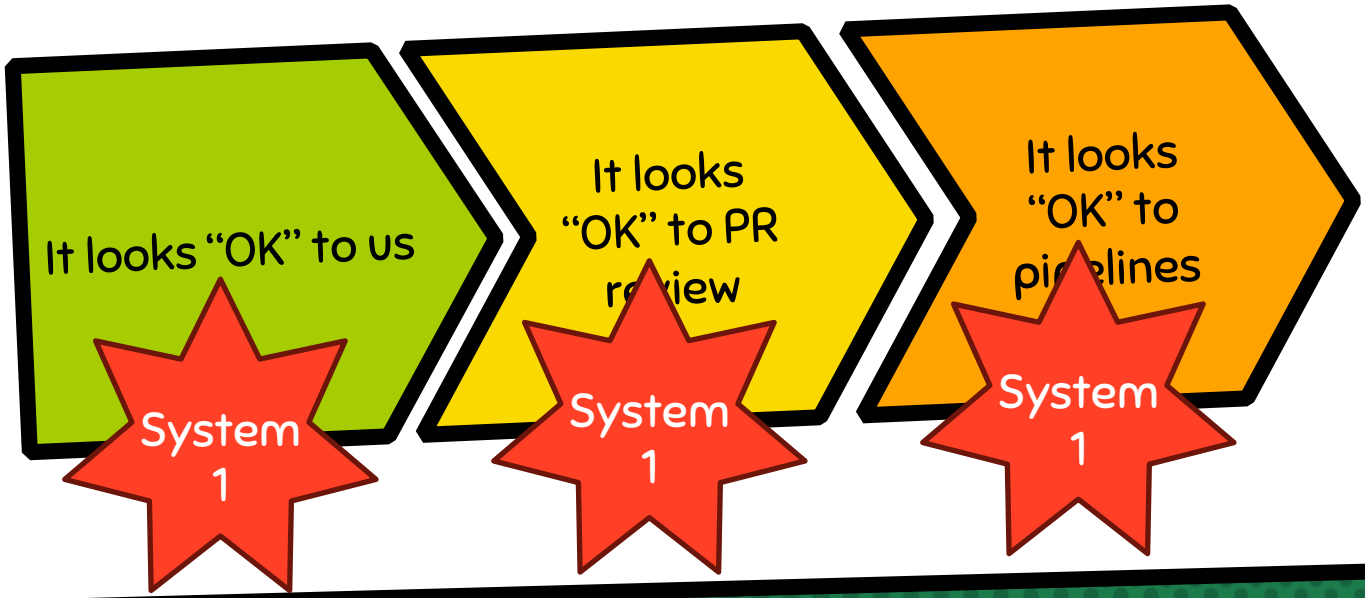
"OK code"


NOT GREAT, NOT TERRIBLE.

WHICH SUCKS LESS?



THE PROBLEM OF "OK CODE"



NEXT THING YOU KNOW:

YOU HAVE AN "OK" PRODUCT

INVEST IN FUEL SAVING TECHNIQUES

The goal: Have enough mental fuel to last all day

Time Management Strategies

- Time Blocking
- Pomodoro Technique


@JBARUCH
#DPE
@DEV2NEXT
SPEAKING.JBARU.CH

Time Management Strategies

- Time Blocking
- Pomodoro Technique
- Task Batching

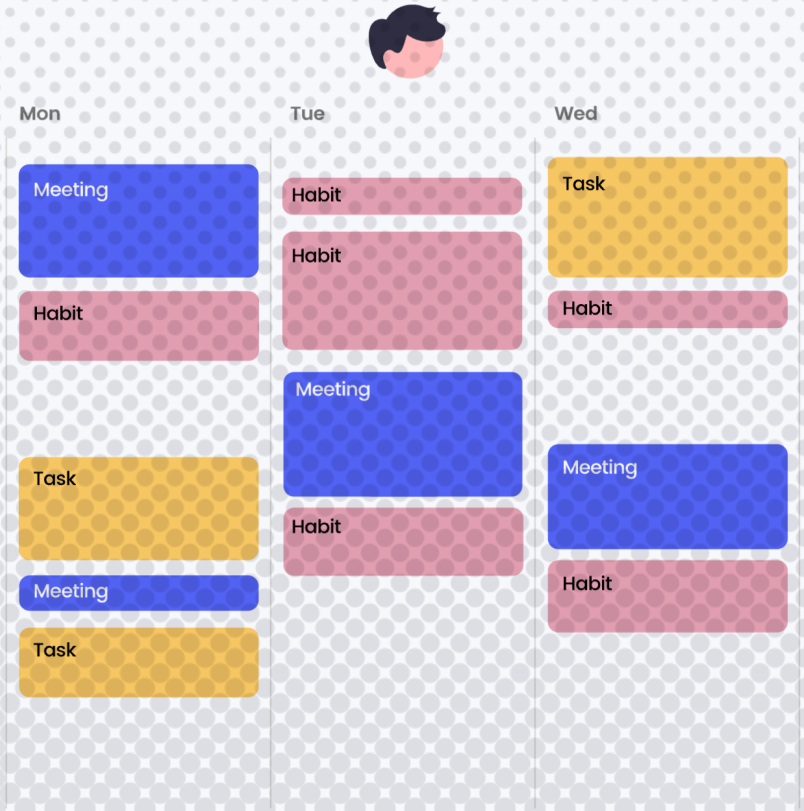
reclaimai

Defend focus time

Find the best time for productive heads-down work in your calendar (while keeping your schedule flexible for changes) — so you can get more done as a team every week.

Tasks Habits Planner

- × Block time
- × Batch tasks
- × Allow access



Mindfulness and Cognitive Practices

- Mindfulness and Meditation
- Reflective Practices
- Single-tasking

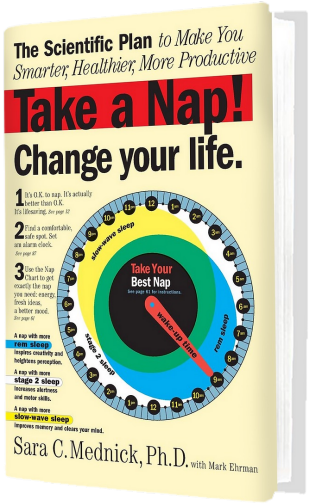
Workspace and Interruption Management

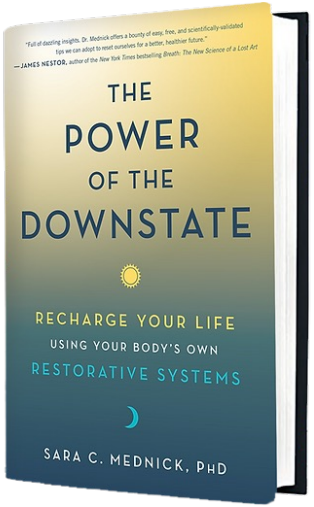
- Workspace Organization
- Notification Management
- Prioritization Techniques

Physical and Mental Well-Being

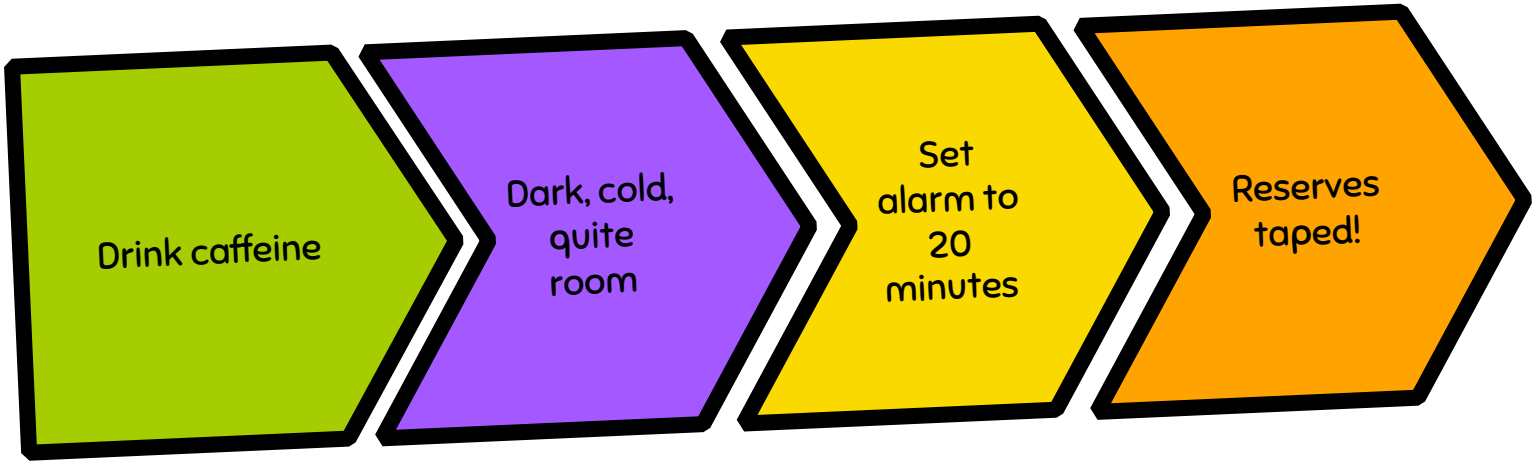
- Physical Exercise
- Breaks and Downtime


@JBARUCH
#DPE
@DEV2NEXT
SPEAKING.JBARU.CH

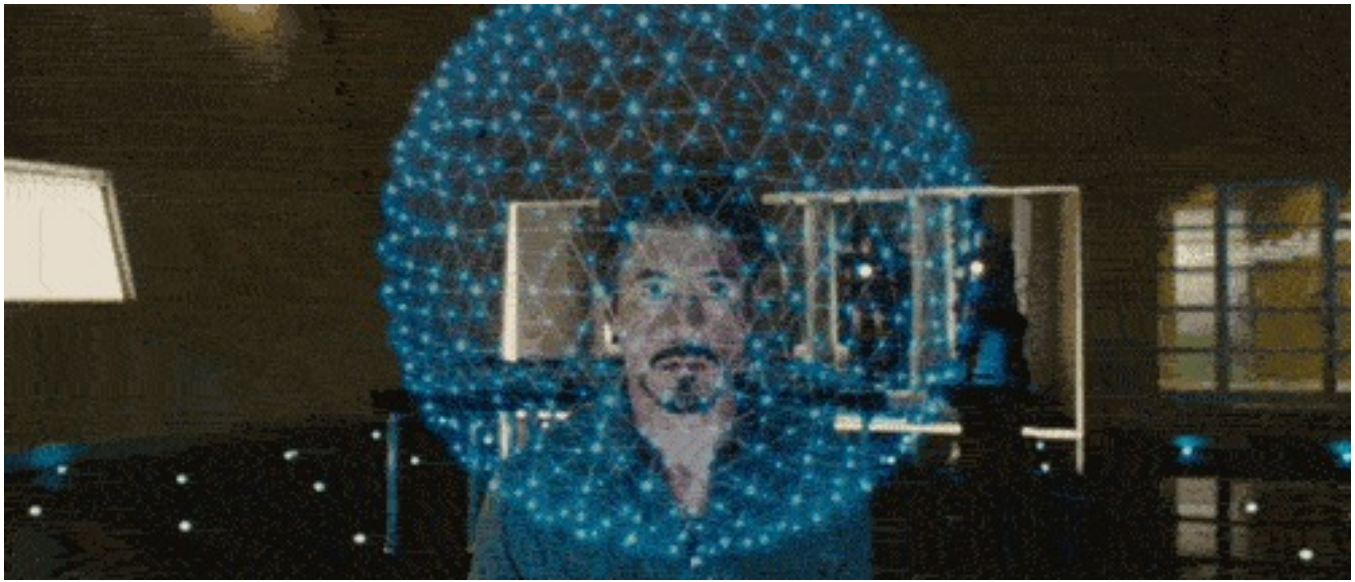

The Scientific Plan to Make You Smarter, Healthier, More Productive
Take a Nap!
Change your life.
Take Your Best Nap
Sara C. Mednick, Ph.D. with Mark Ehrman


THE POWER OF THE DOWNSTATE
RECHARGE YOUR LIFE
USING YOUR BODY'S OWN
RESTORATIVE SYSTEMS
SARA C. MEDNICK, PHD

CAFFEINE NAP



AND... DEVELOPER PRODUCTIVITY ENGINEERING!



DEVELOPER PRODUCTIVITY ENGINEERING

Foster Faster Feedback

Collaborate through Effective Tooling

Embrace Rigorous Observability for Proactive Improvement

Eliminate Toil for Developers

Prioritize Automation and Eliminate Bottlenecks

Dedicated Organizational Mindset

Outcomes Over Output

Feedback efficiency

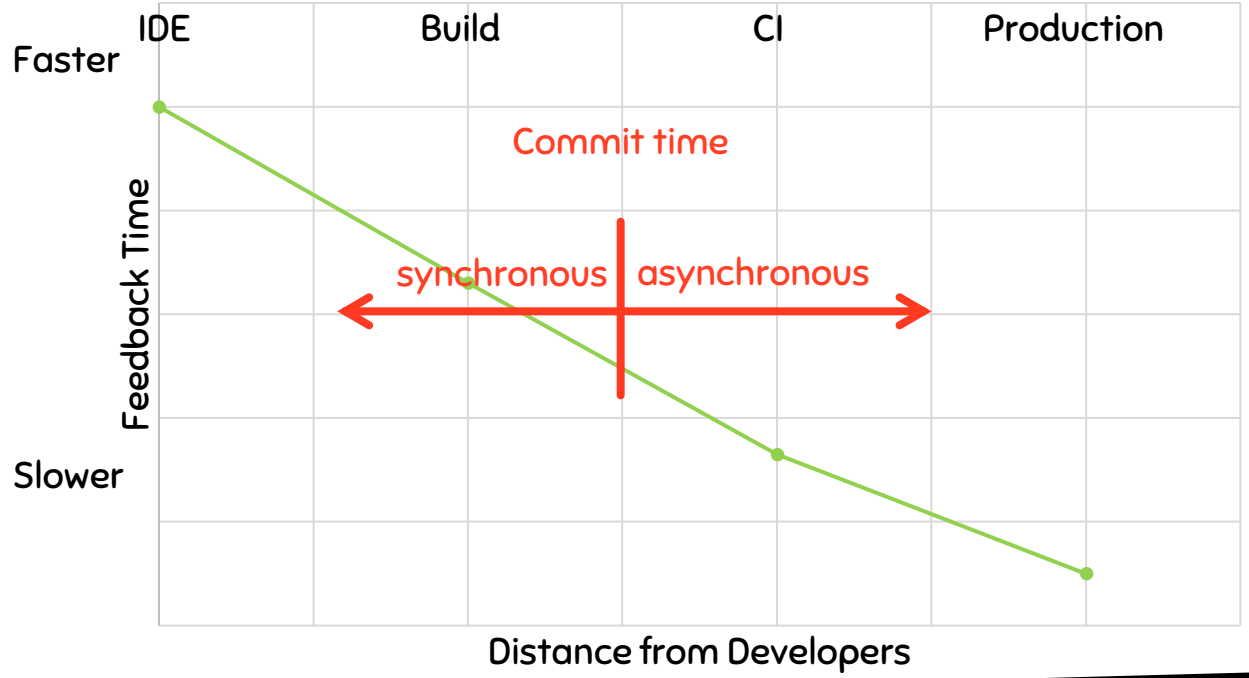
- IDE: Sub-seconds (I type, it marks it red)
- Build: Seconds
- CI: Minutes
- Production: Hours/Days

REVERSE DEPENDENCY ON DISTANCE FROM DEVELOPERS

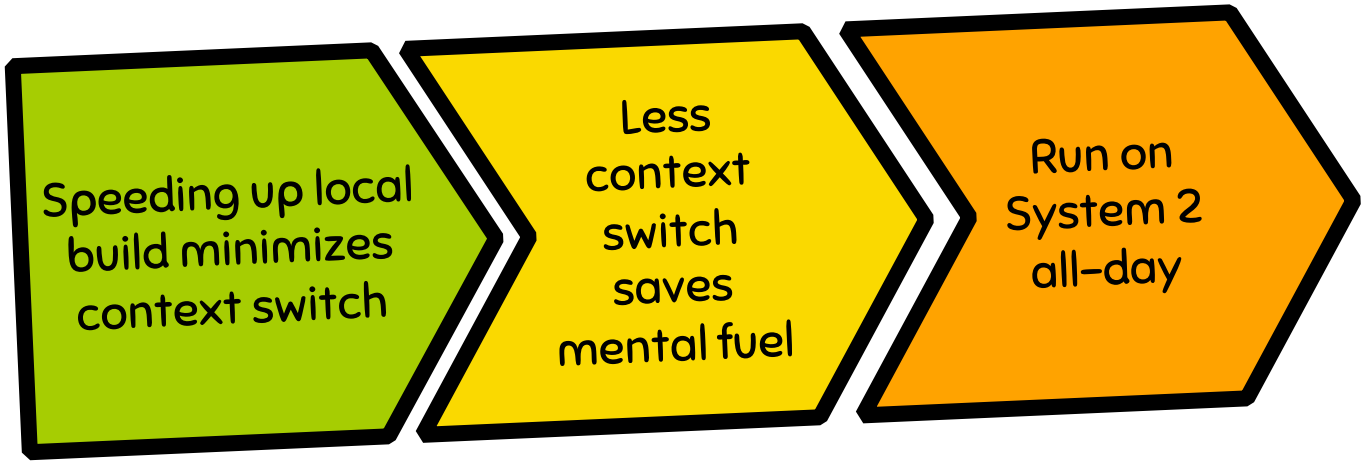
Two Types of Feedback

Asynchronous	x e.g., CI/CD x we never wait for it x results are distracting
Synchronous	x e.g., build x we'll wait for it in the flow x we'll be pissed off when it's slow

REVERSE DEPENDENCY ON DISTANCE FROM DEVELOPERS



"Faster Foster Feedback" Saves Mental Fuel



How can we engineer less context switches?

- Measure local build times!
- Avoid building and testing what didn't change
- Speed up what can't be avoided
- Fight evil flaky tests!
- Watch your build like a hawk for degradations

What you can do today (for free)

- Parallel local
- Local caching
- Remote caching*
- Build Scans
- Win Prizes (a.k.a. speed challenge)

What your company should pay for

- All the books (see shownotes)
- Top development hardware
- Develocity (or similar)

LEARN MORE AND TRY IT TODAY!

- Take the Gradle/Maven Speed Challenge
- Be DPE Agent of Change!
- Read the DPE Handbook
- Watch the DPE Summit videos

SPEAKING.JBARU.CH

WATCH THE KEYNOTES!