

welcome
to our workshop on
software design & AI

Daniel Jackson & Eagon Meng · MIT CSAIL/EECS · April 2026

introducing
myself

my career in buildings



Physics at Oxford



Programmer for Logica UK

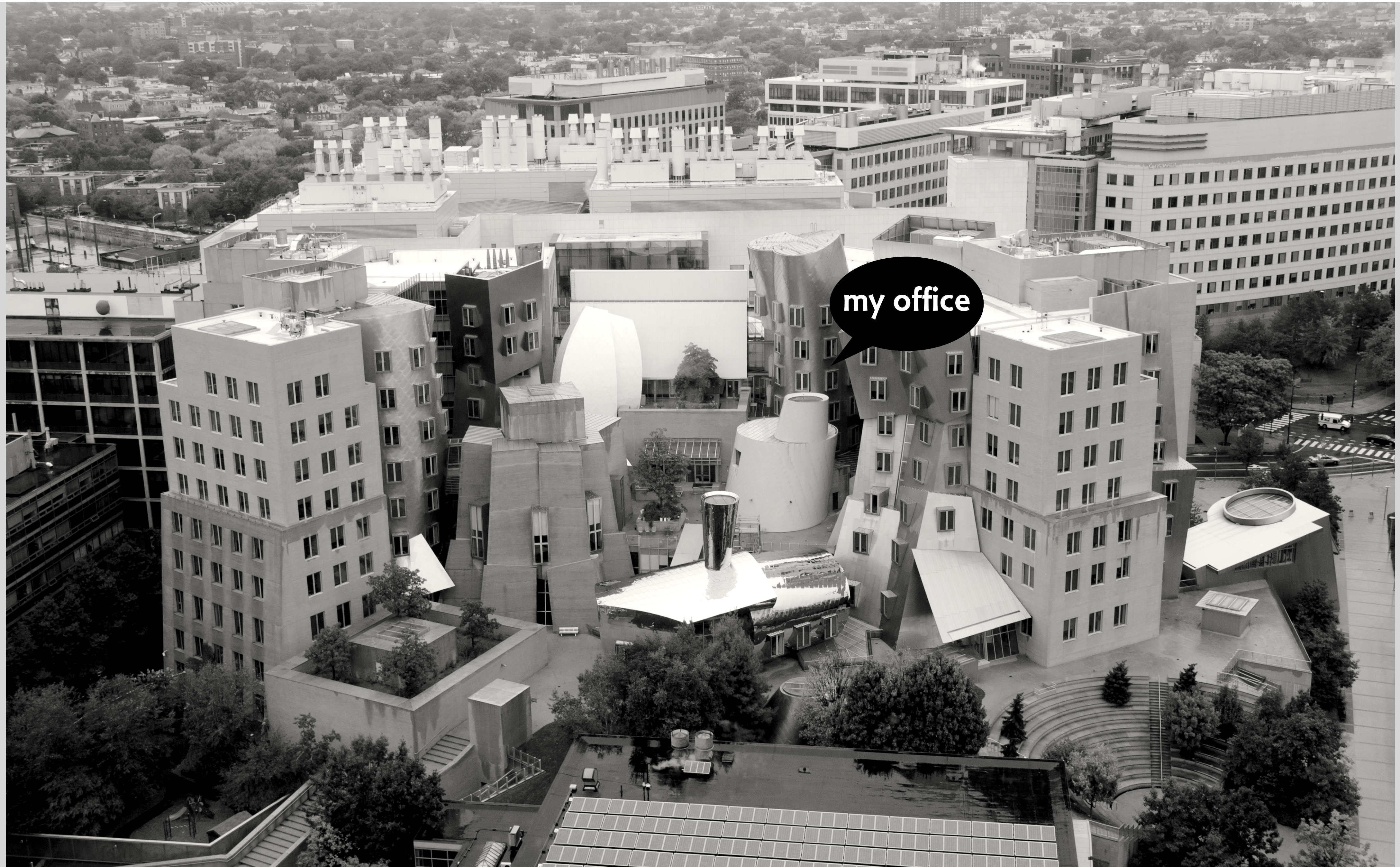


Computer science PhD at MIT

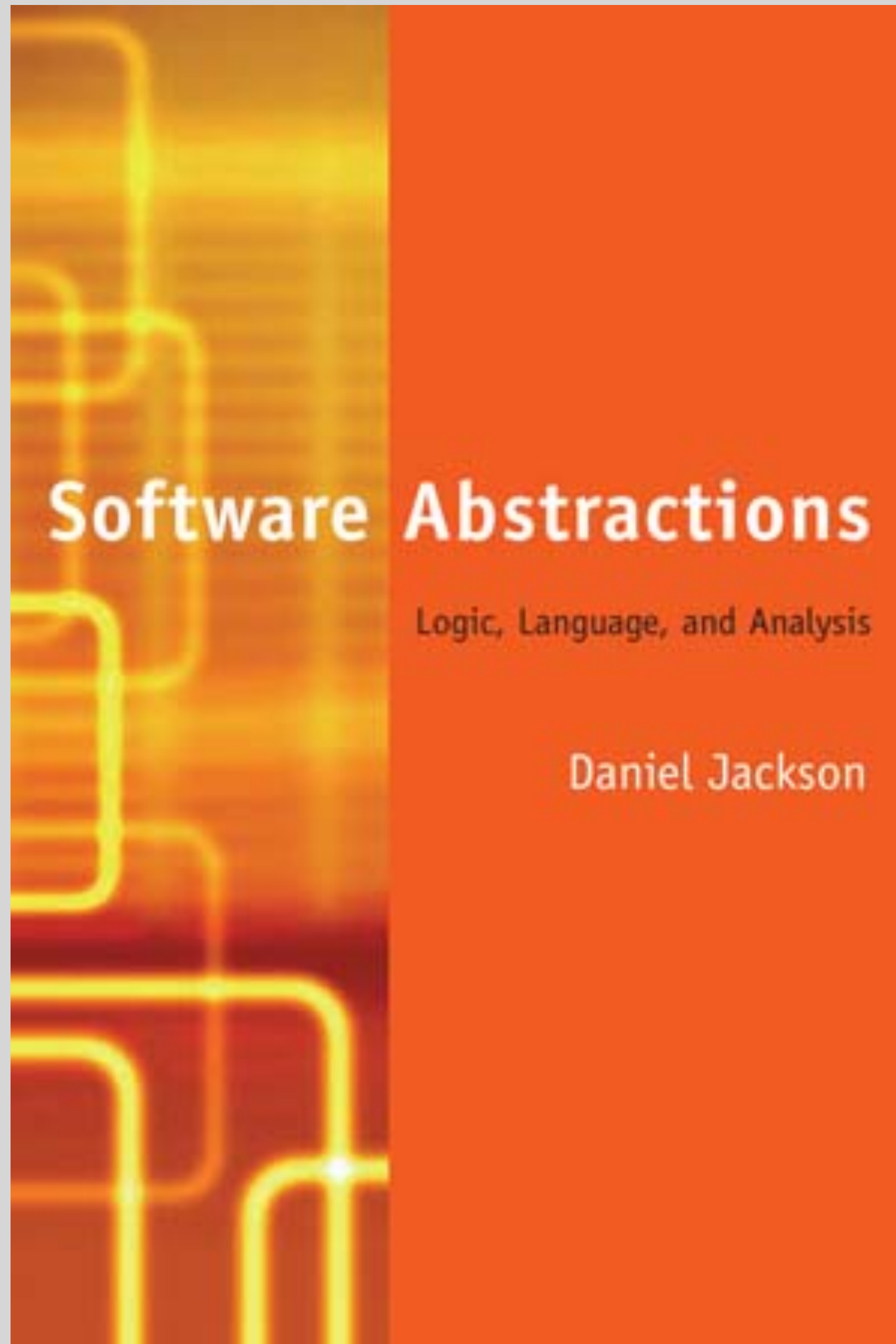


Assistant prof at CMU

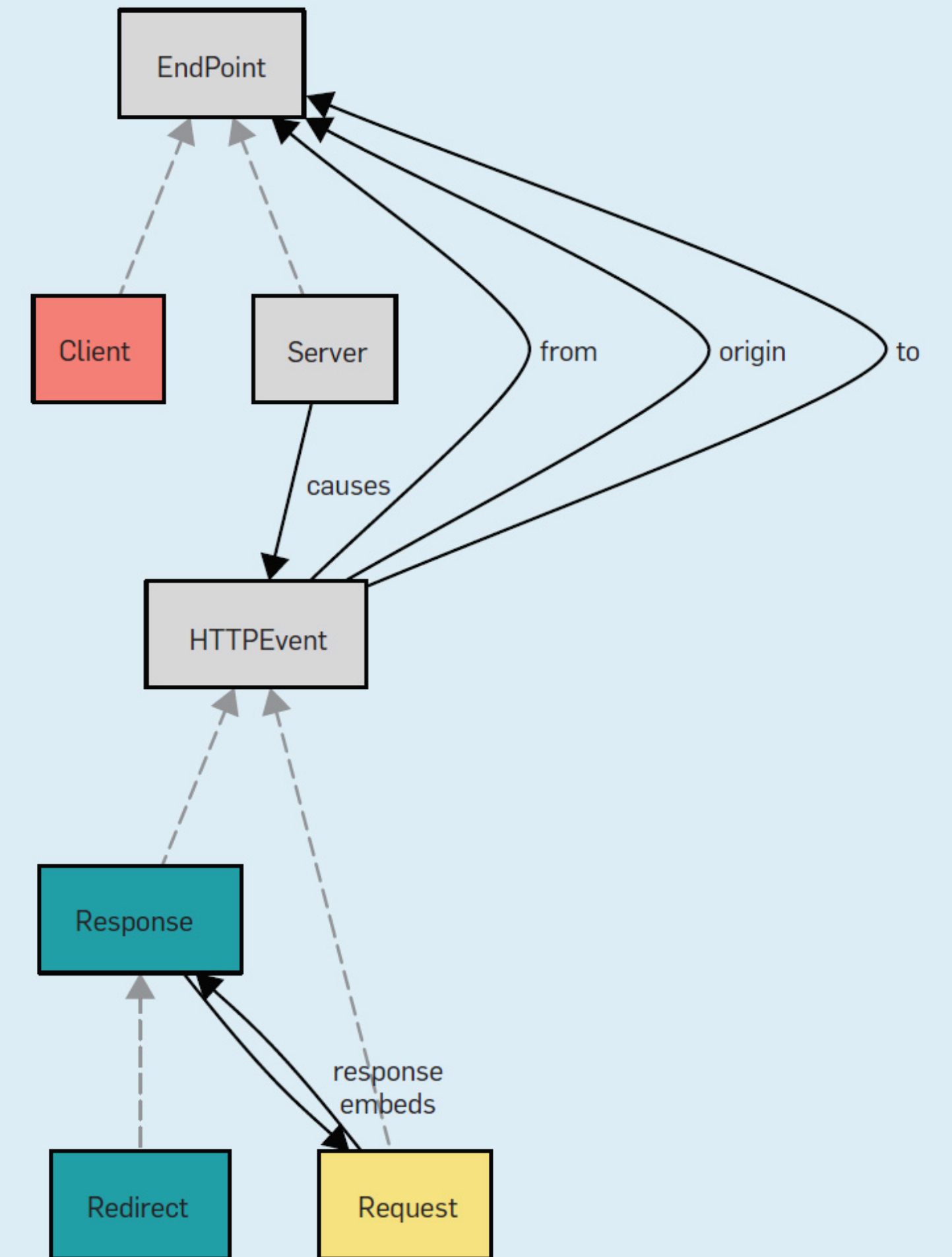
where I work now



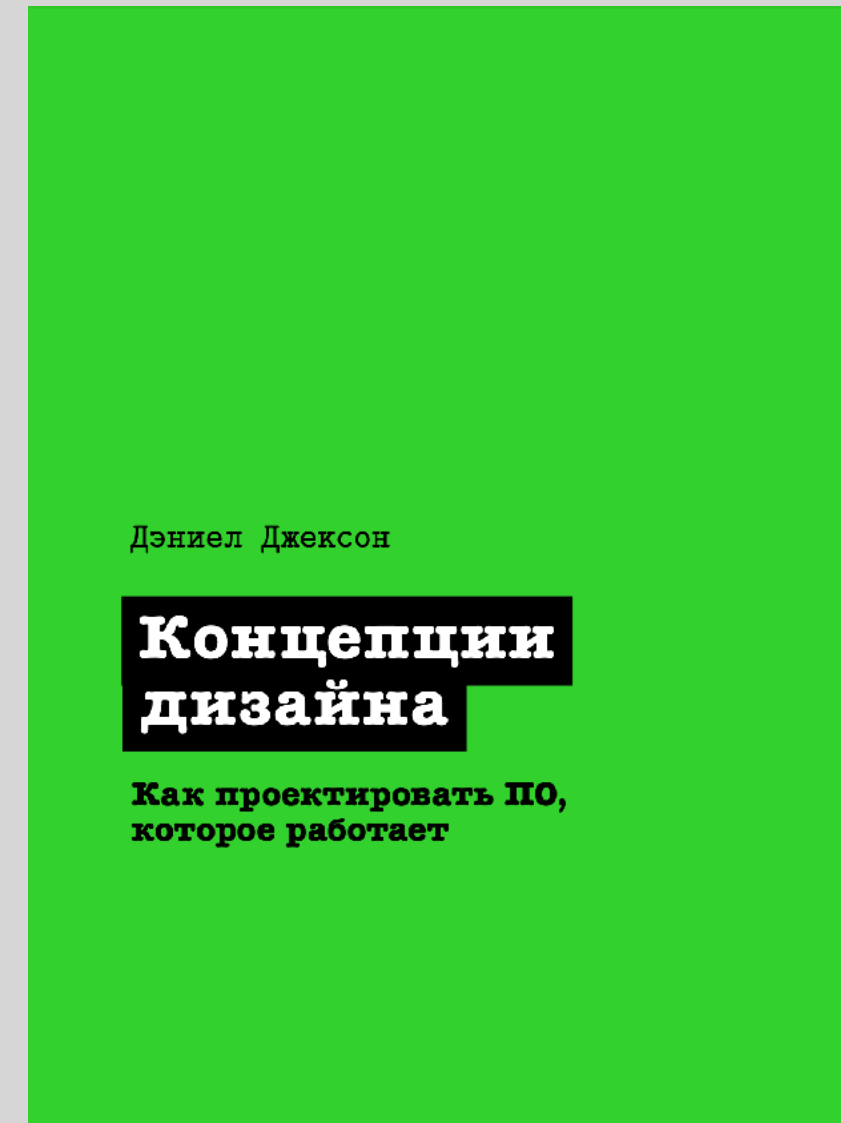
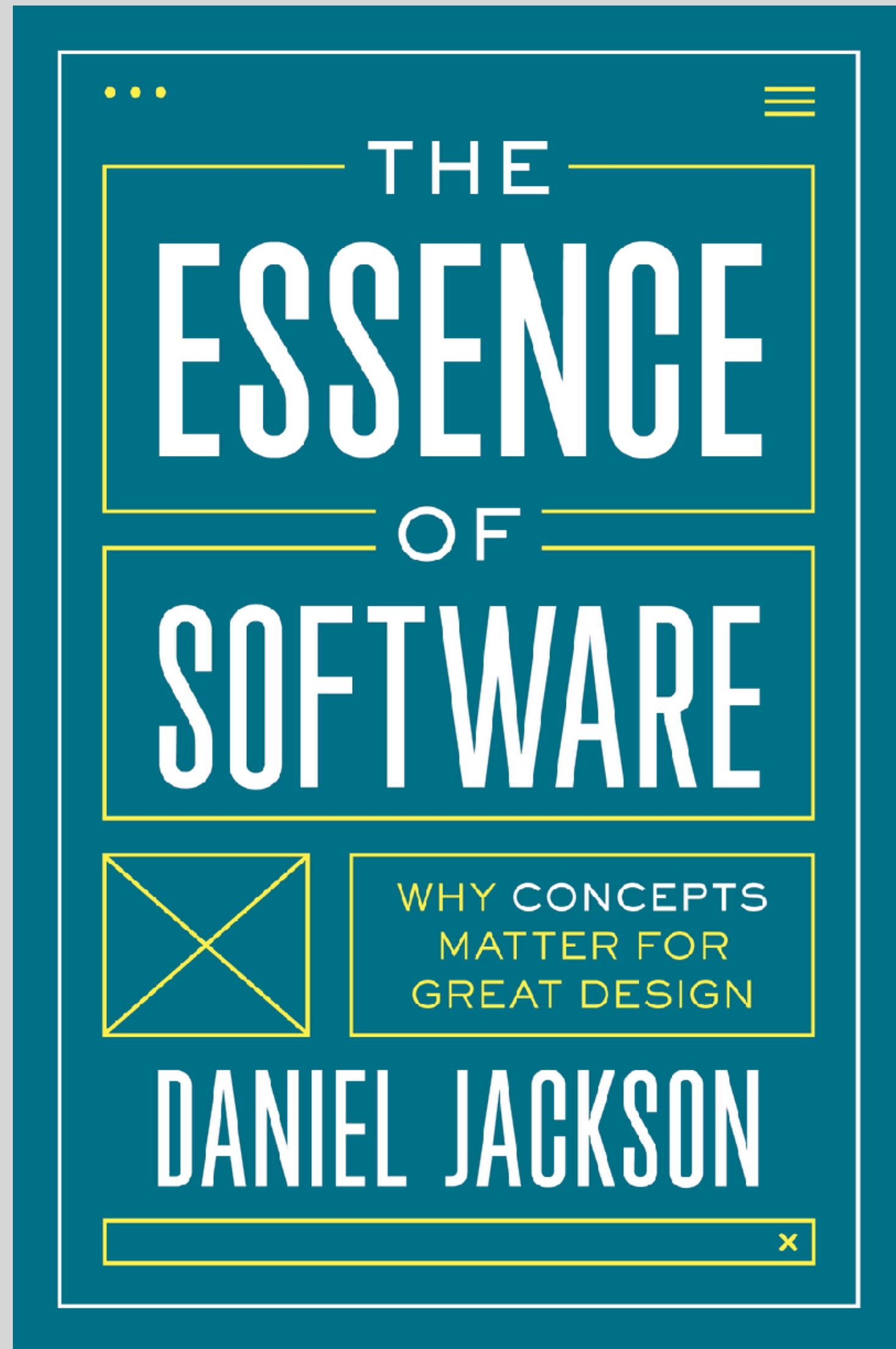
alloy: a lightweight, analyzable modeling language



```
1  abstract sig EndPoint { }
2  sig Server extends EndPoint {
3    causes: set HTTPEvent
4  }
5  sig Client extends EndPoint { }
6  abstract sig HTTPEvent {
7    from, to, origin: EndPoint
8  }
9  sig Request extends HTTPEvent {
10   response: lone Response
11 }
12 sig Response extends HTTPEvent {
13   embeds: set Request
14 }
15 sig Redirect extends Response {
16 }
```



concepts: a new approach to software design



when I'm not working, I'm taking photographs



workshop
plans & goals

Time	Activity	Topics
10:00	Welcome	<i>Introductions, goals, schedule, book</i>
10:15	A new modularity	<i>AI challenges, concept modularity</i>
10:45	What software design is about	<i>Function, patterns, eliminating friction</i>
11:15	Exercise 1	<i>Functional design of sidecar app</i>
11:45	Designing with concepts	<i>Action-state models, concerns, syncs</i>
12:30	Exercise 2	<i>Concept design of sidecar app</i>
1:15	Demo	<i>Code generation and context</i>
1:35	Conclusion	

workshop goals

offer you a fresh viewpoint

a diagnosis for what's wrong with AI-based software dev currently
a vision of how to fix it using better software practices
not just fixing pain points of LLMs: an evolution of software design

give you a language to articulate design ideas

a way to shape the functionality of software you design
a shared language for UX, engineering, marketing... and LLMs

introduce you to our research

part of an ongoing project, more coming

schedule, slides, etc

<https://essenceofsoftware.com/cap>

how about you?

in three words or less, what is your company's posture on AI-based coding?



in three words or less, what in your view is the major issue with AI-based coding?



the book
(a gift for you)

THE
ESSENCE

OF
SOFTWARE

WHY CONCEPTS
MATTER FOR
GREAT DESIGN

DANIEL JACKSON

analyzed about 100 software apps

what makes them good? what causes problems?
best not worst: Adobe, Apple, Google, Microsoft, etc

evolved approach to concept design

a way to describe & structure functionality
simple & applicable design principles
showed how violations lead to bad experiences

half the book is end notes

organized as standalone mini-essays
where the substance is (including my best pasta recipe)

book was published before ChatGPT

key ideas in book apply more than ever (phew!)
focus of book is on UX and design clarity, not coding