

80/20 Optimierung von Test-Suites

Erfahrungen aus Forschung und Praxis



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Raphael Nömmer

09.12.2020

Test Suites dauern zu lang



Hardware in the Loop



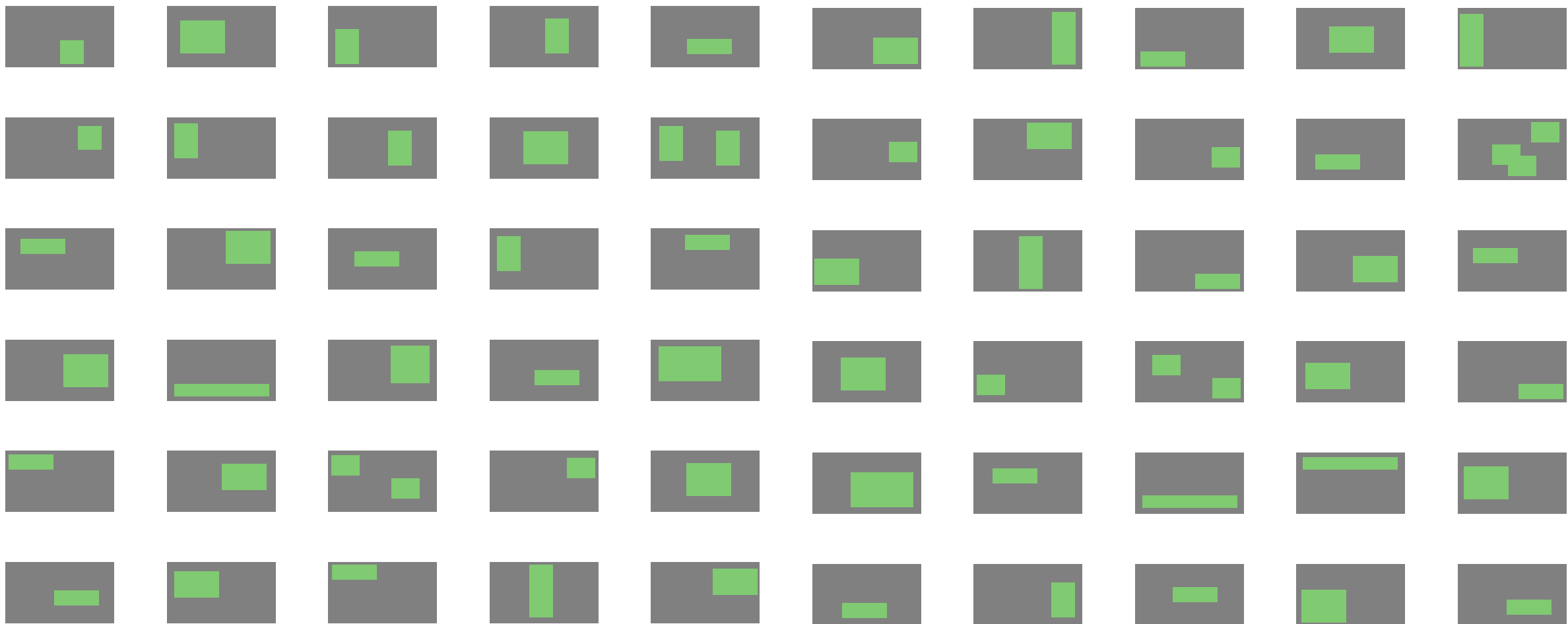
Manuelle Tests

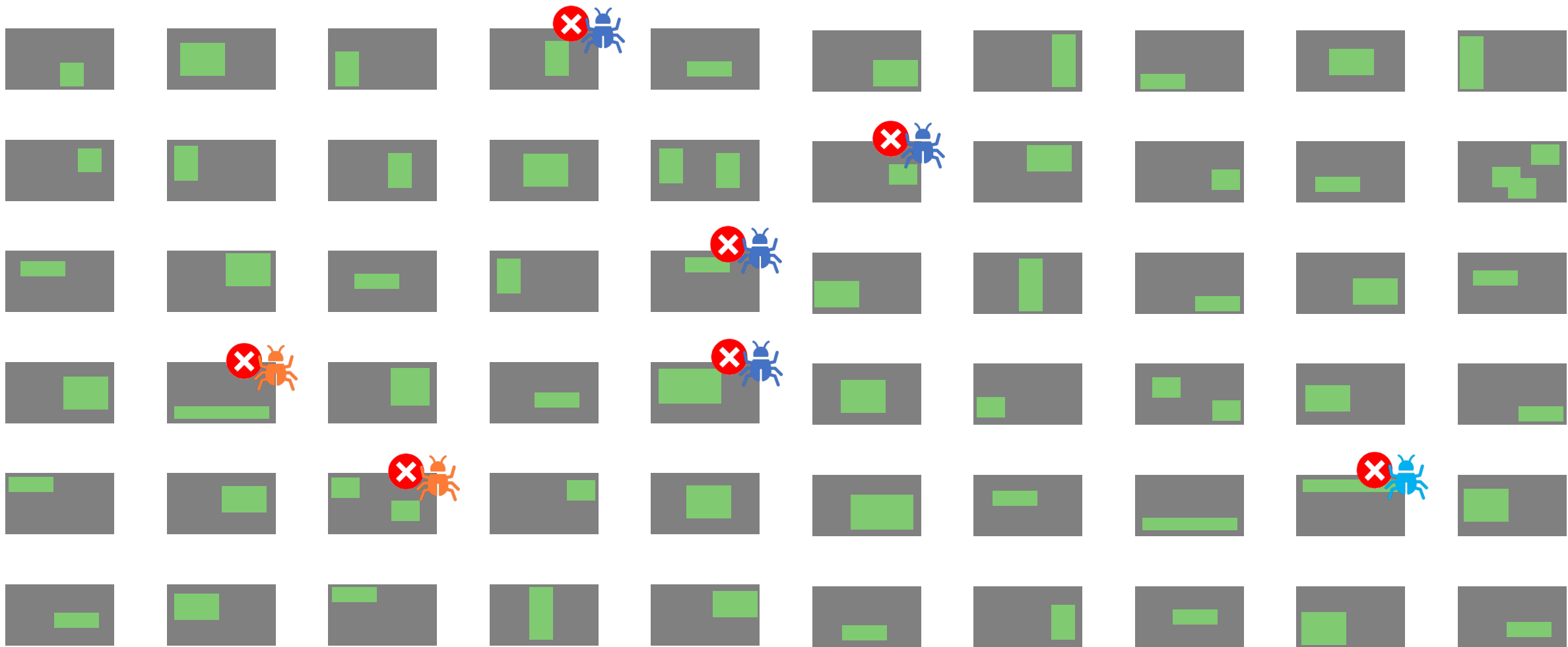


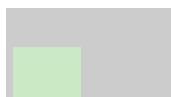
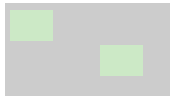
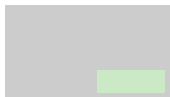
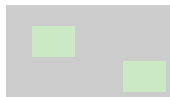
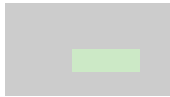
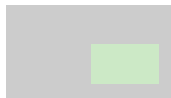
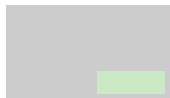
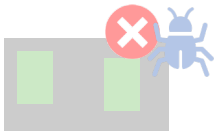
Ui Tests



<https://www.technica-engineering.de/produkte/bts-body-electronic-test-system>







Warum gibt es hier Optimierungspotential?



Layers

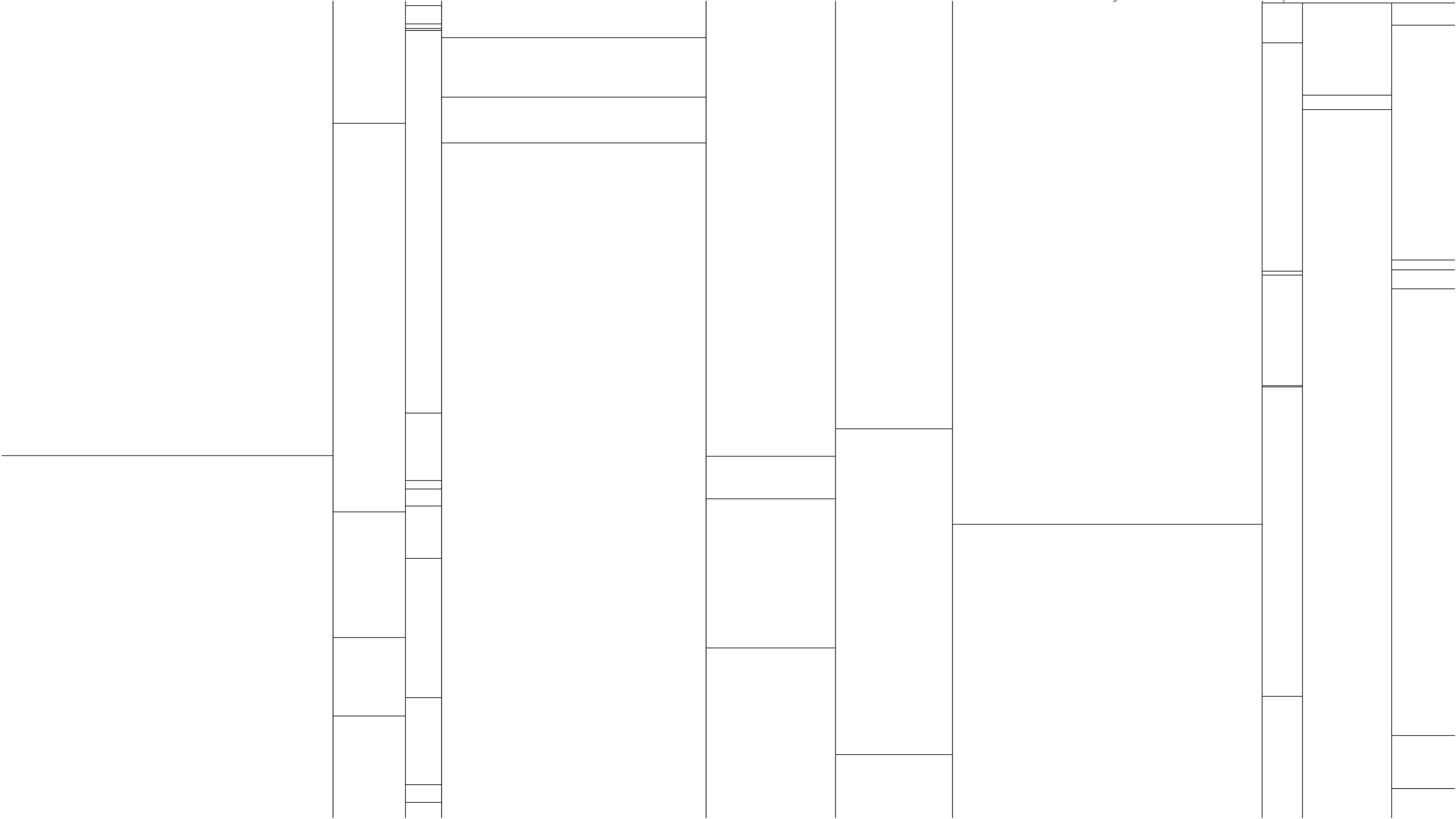
Opacity: 100 % Normal

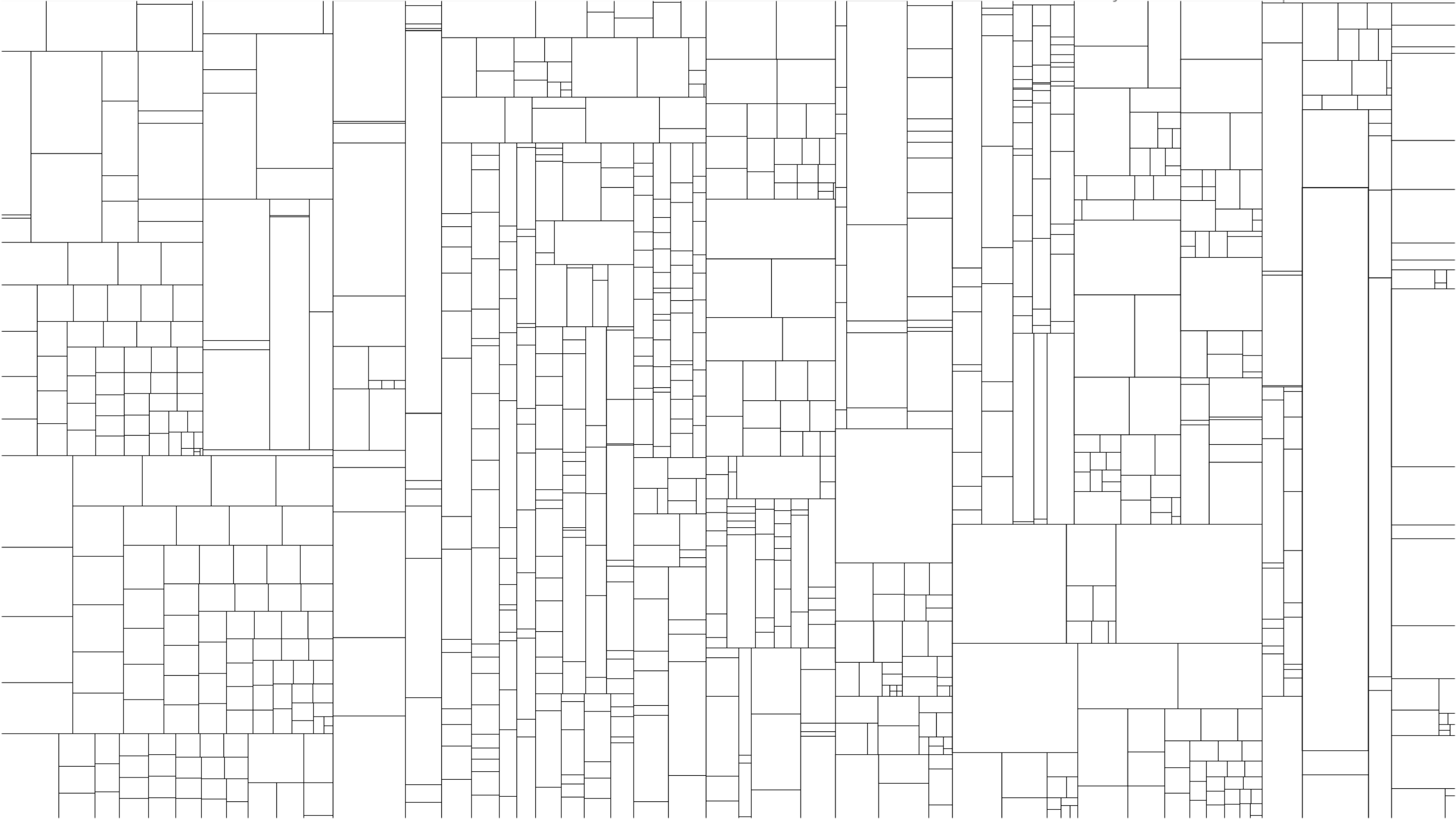
layer 1

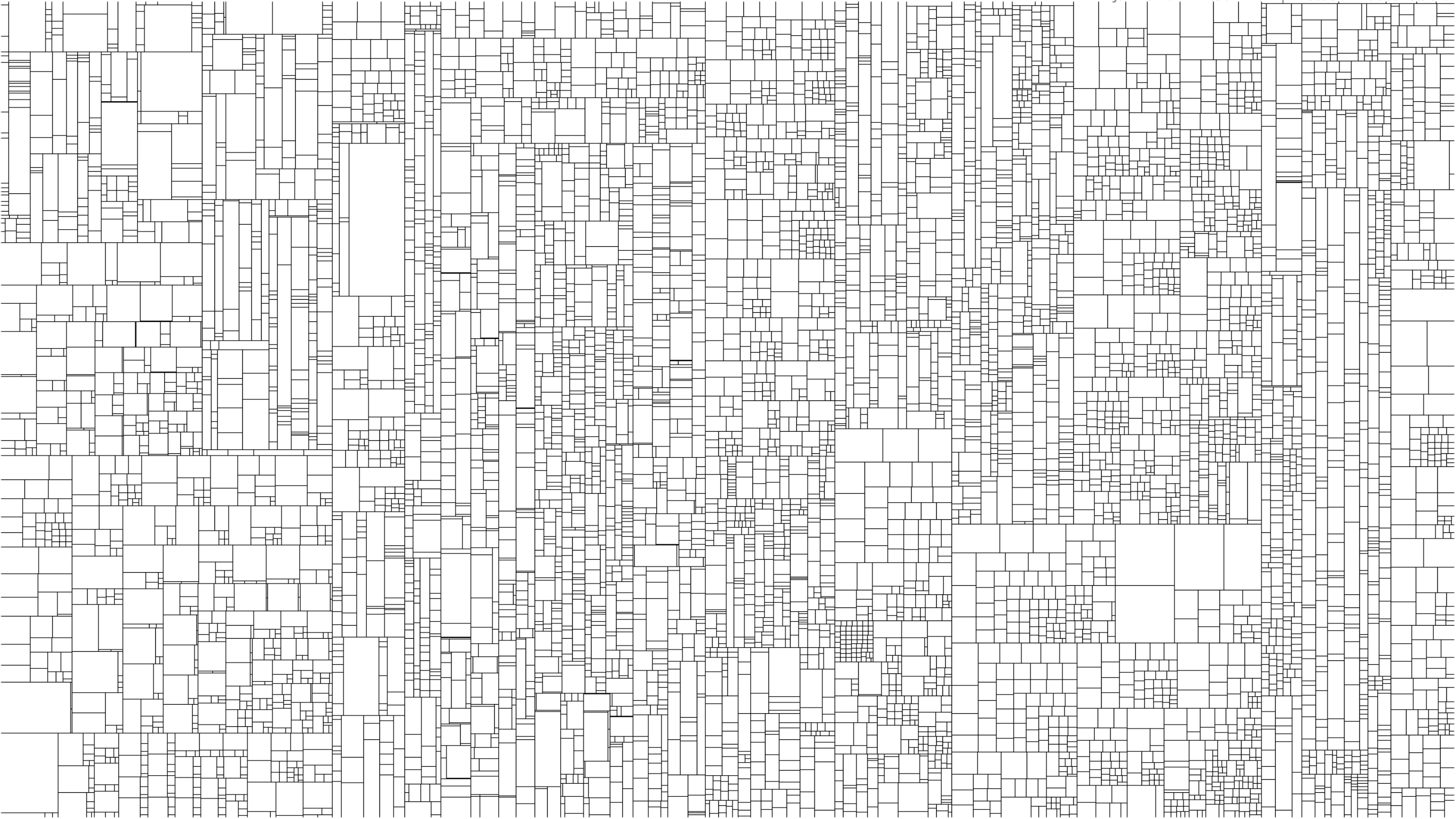
+

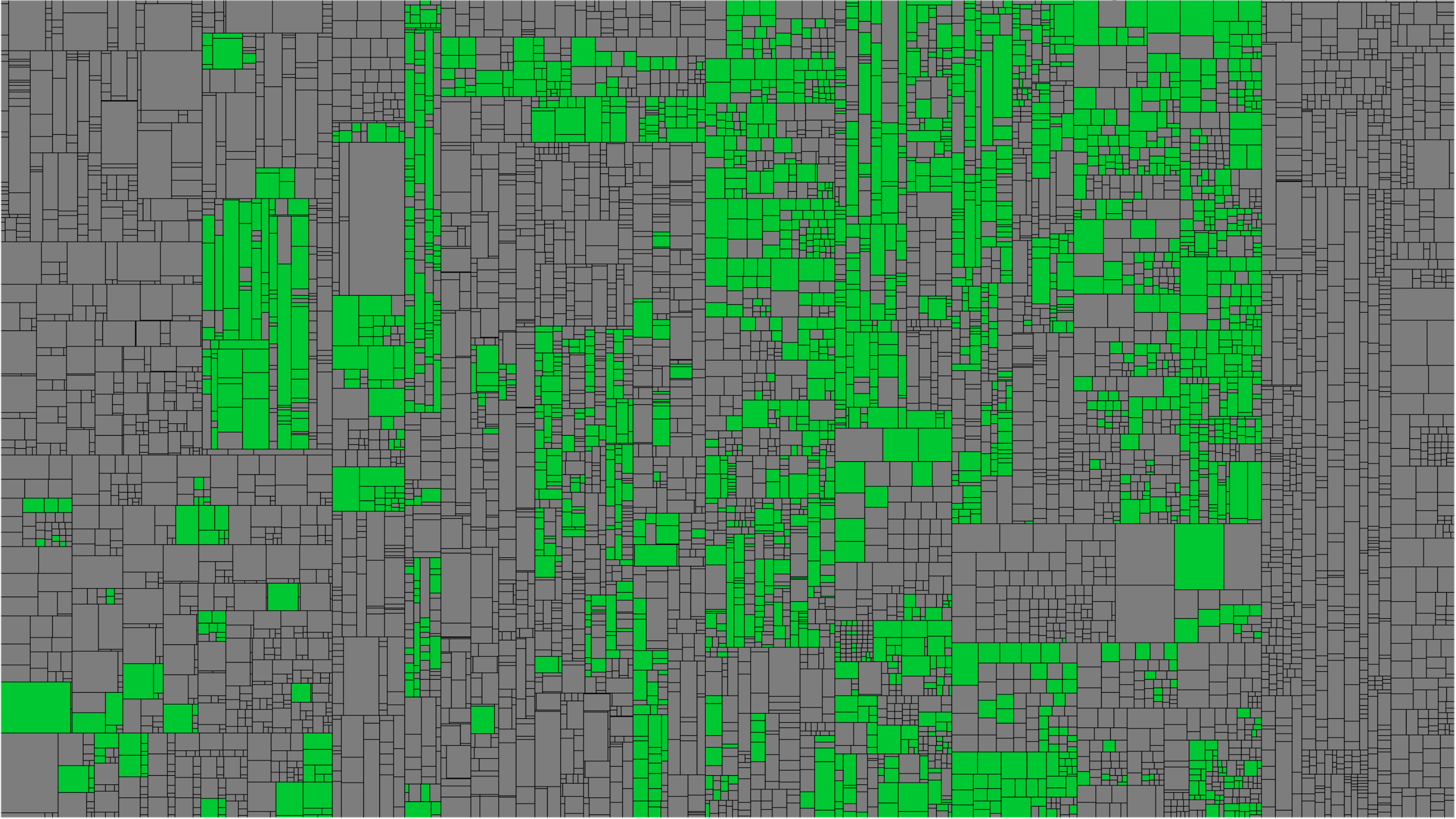
-

T

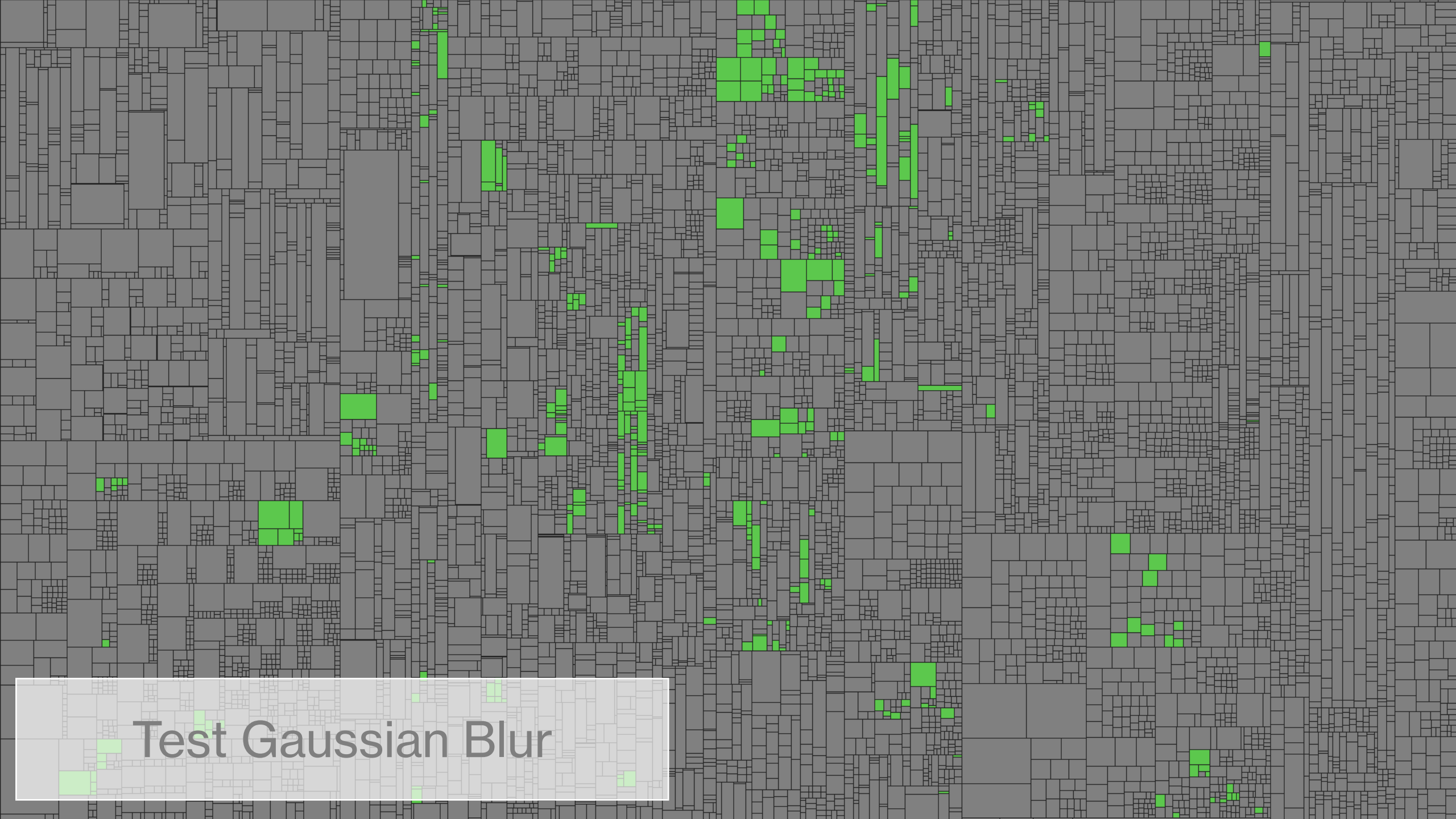




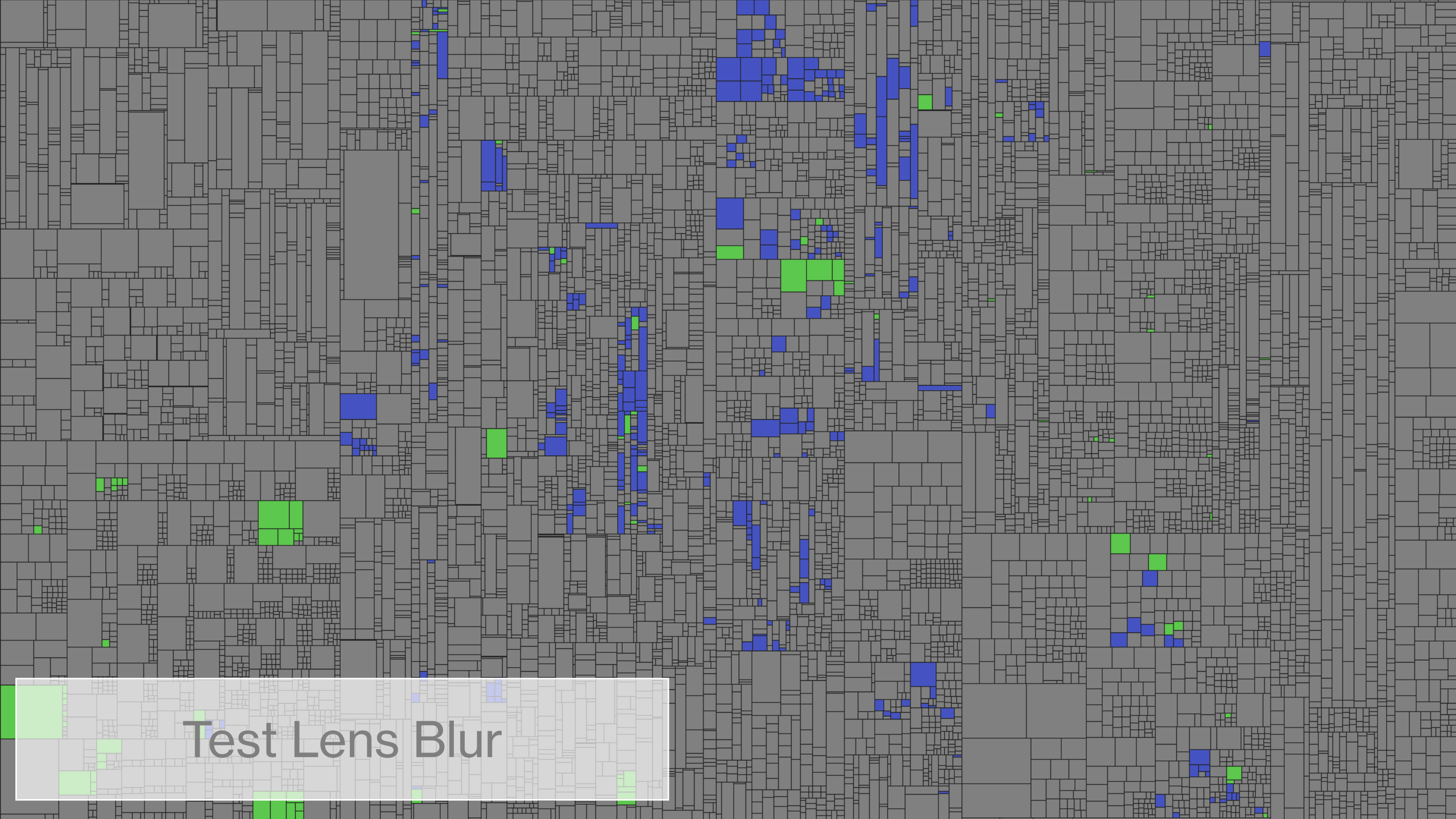




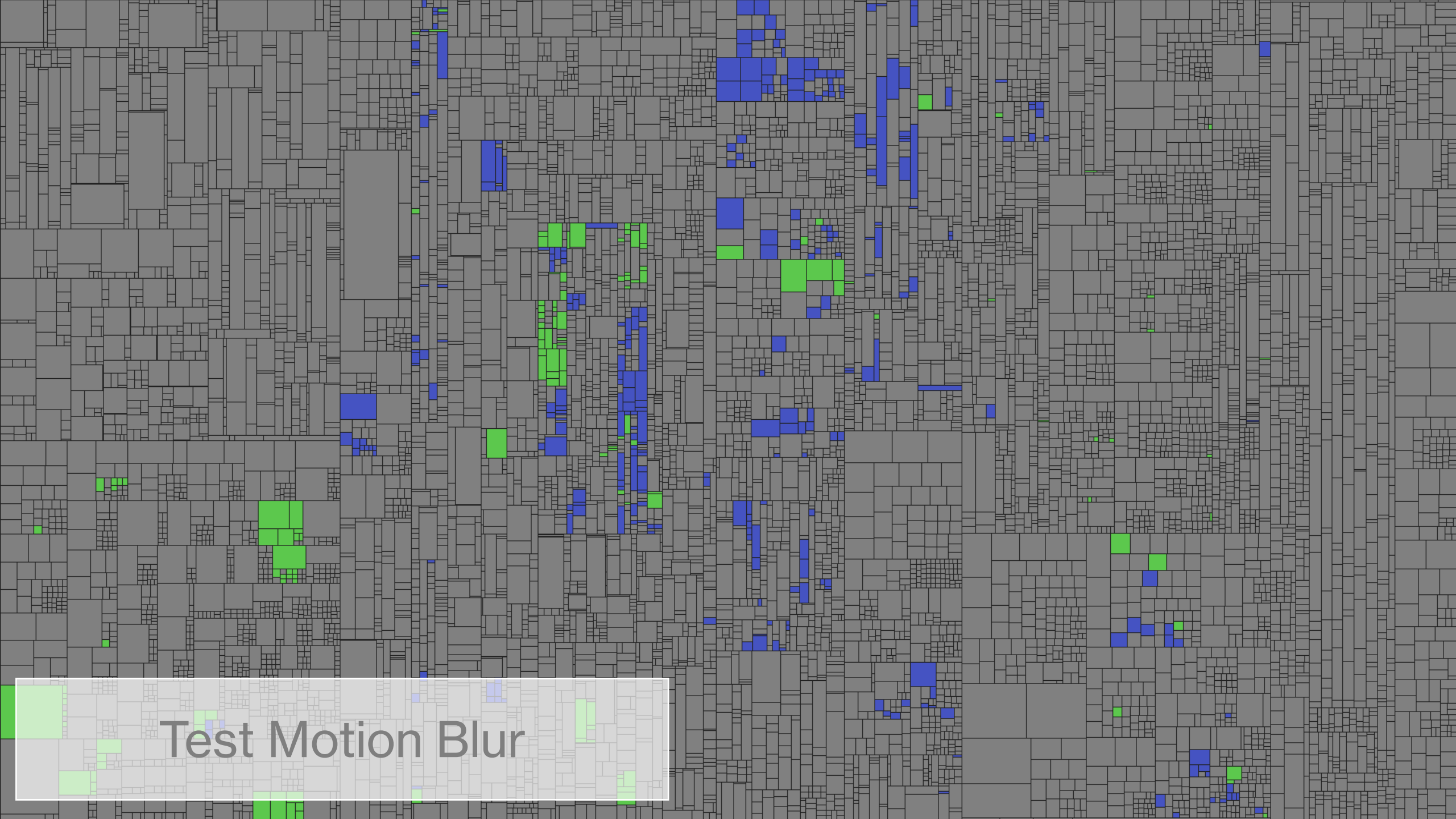
**Welchen Einfluss hat die Reihenfolge der
Ausführung von Software Tests?**



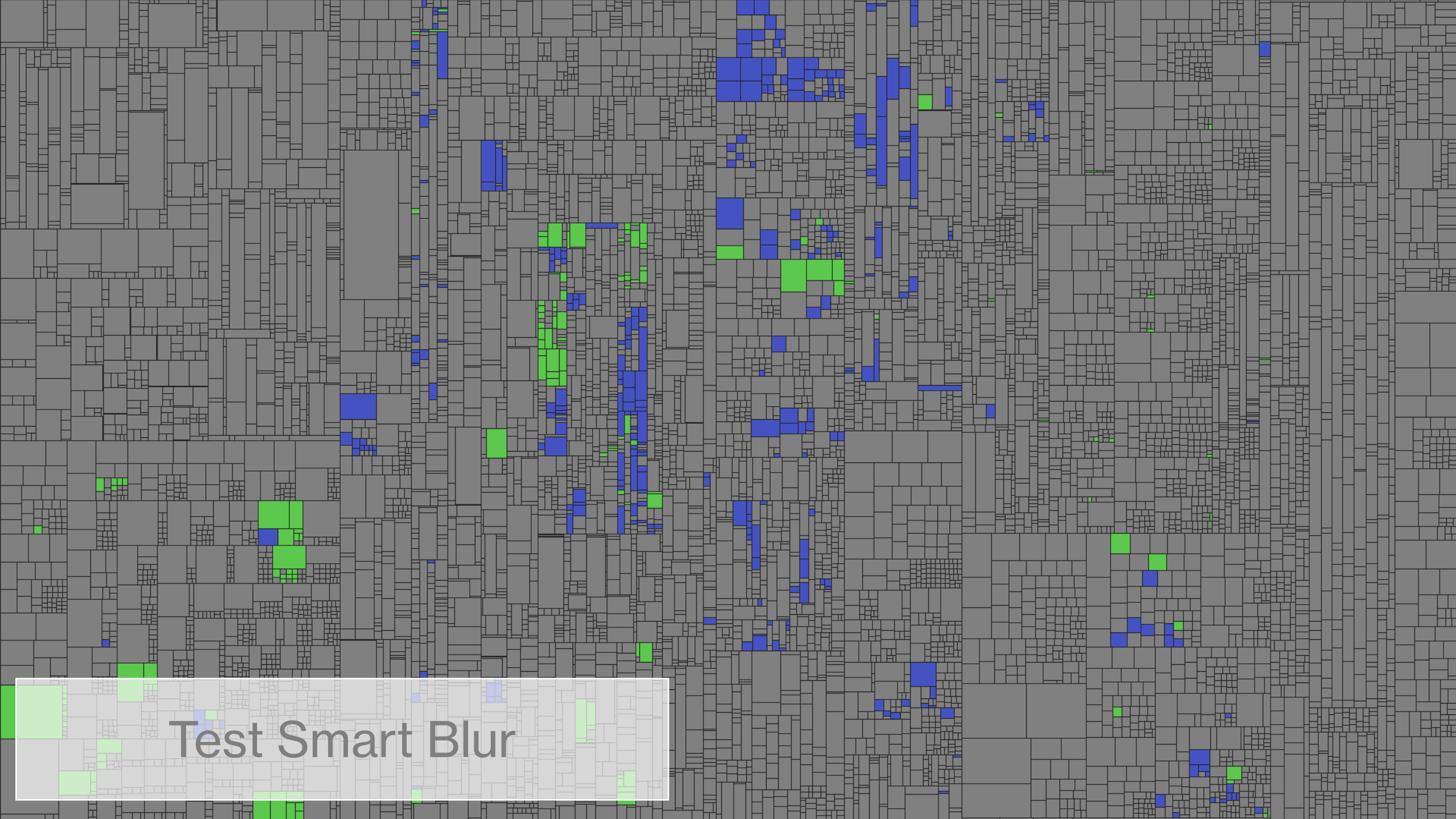
Test Gaussian Blur



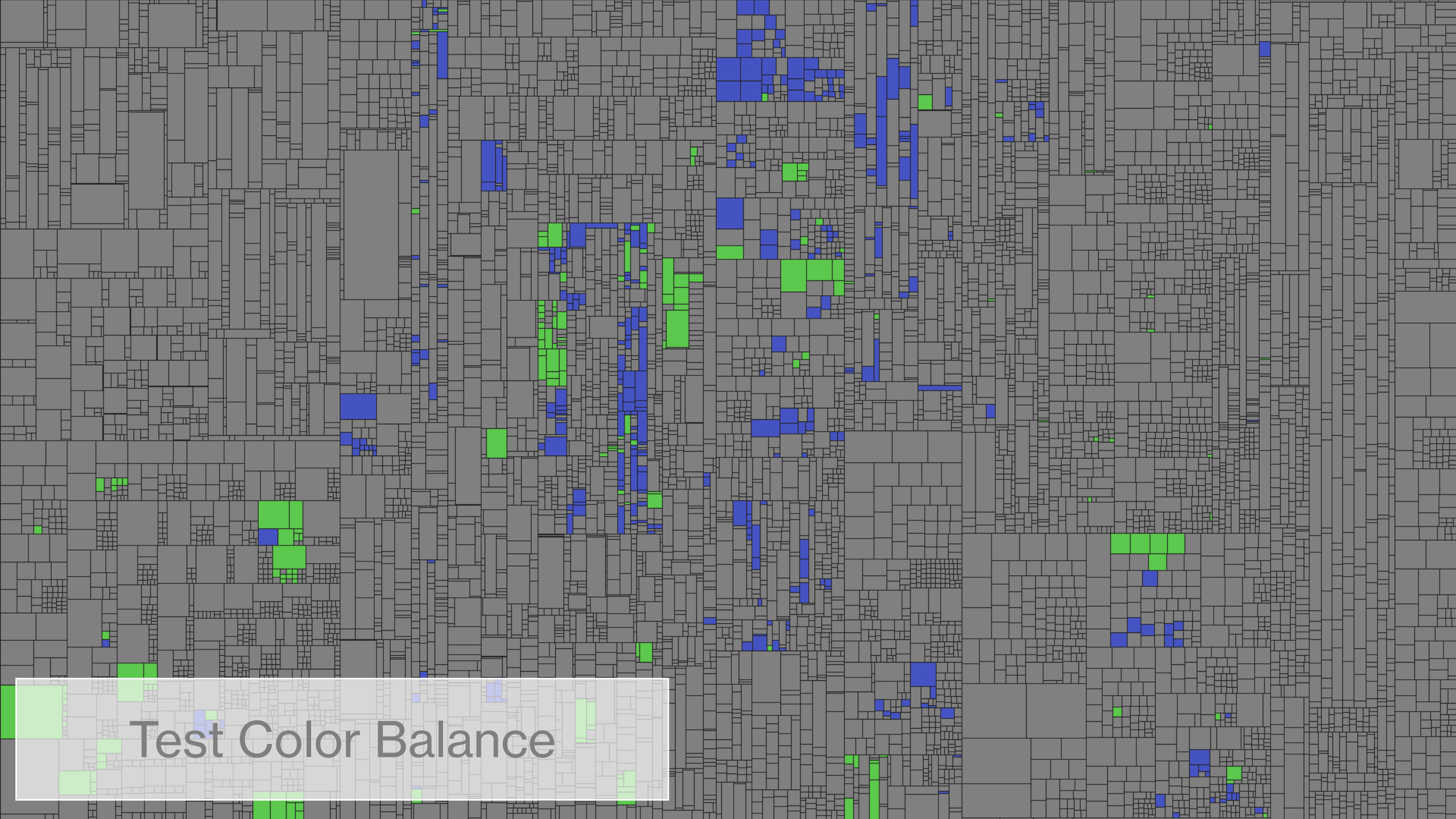
Test Lens Blur



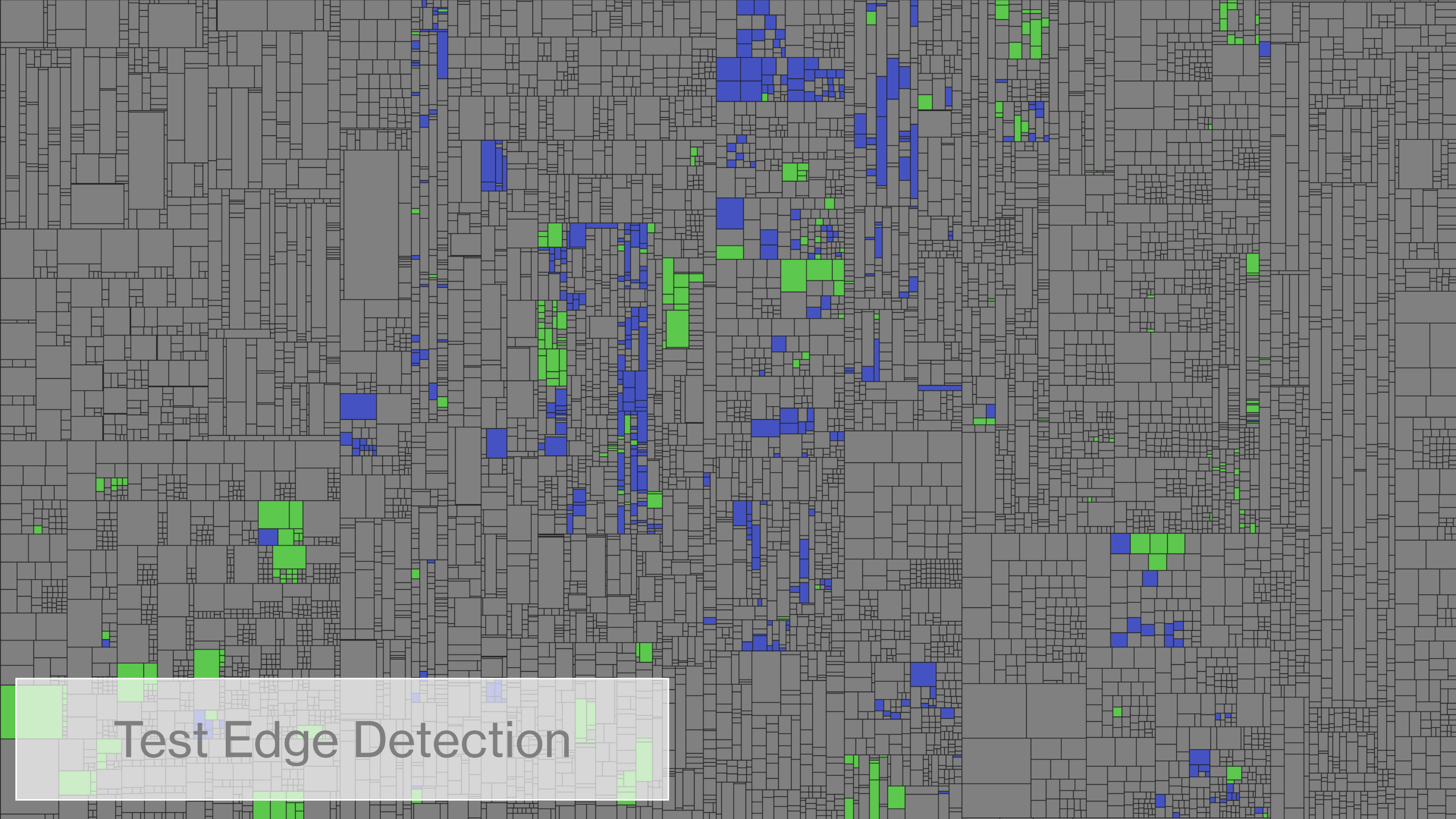
Test Motion Blur



Test Smart Blur

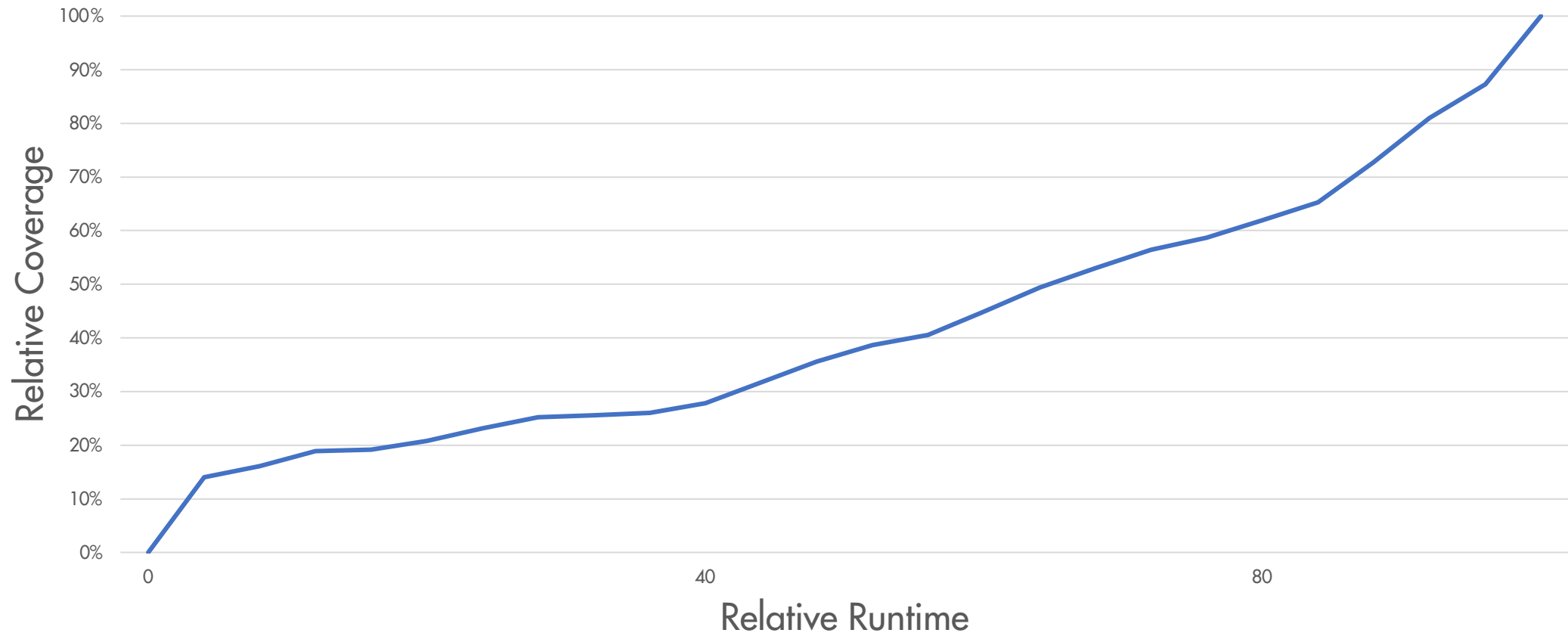


Test Color Balance



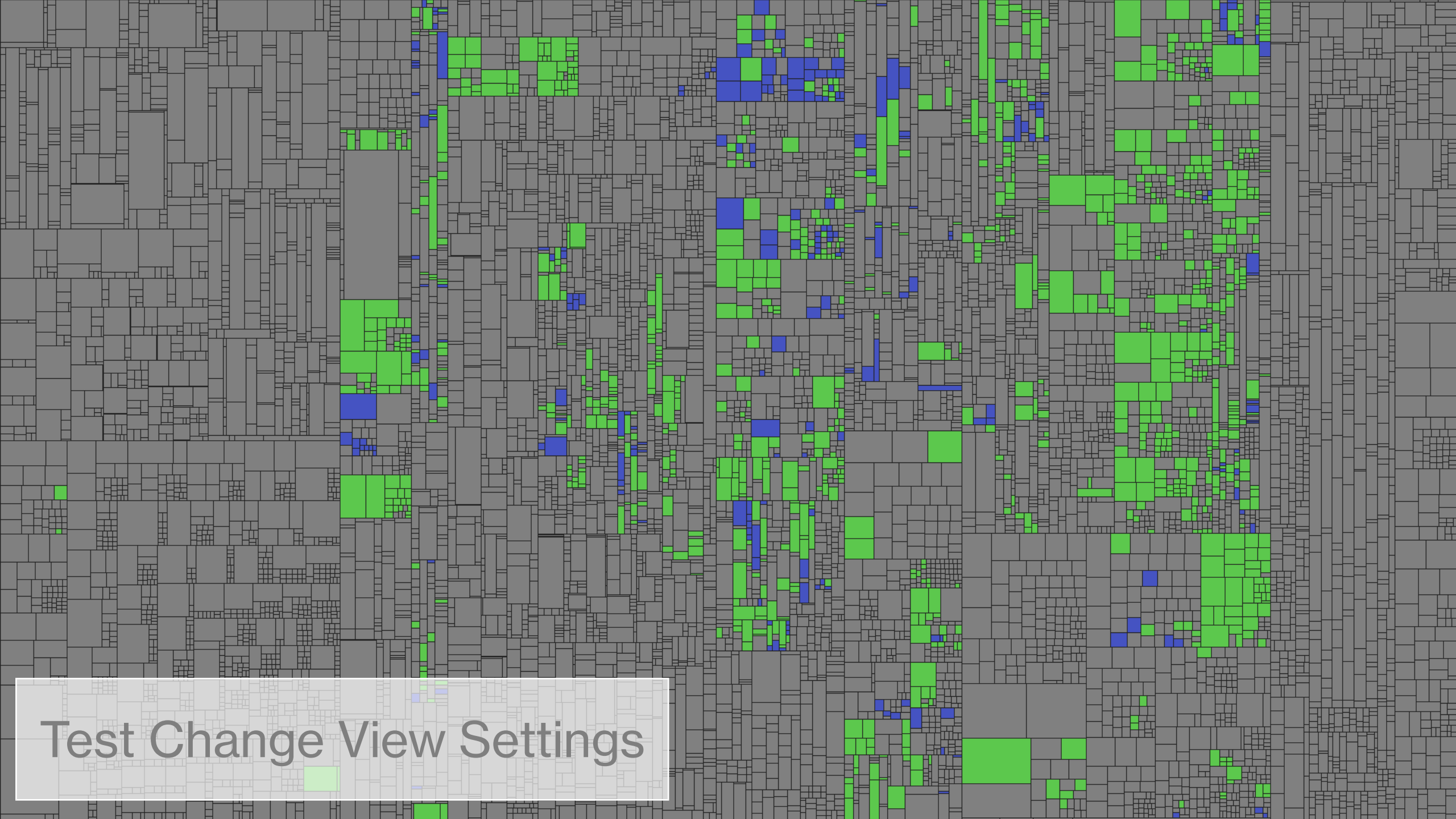
Test Edge Detection

Time vs Code Coverage

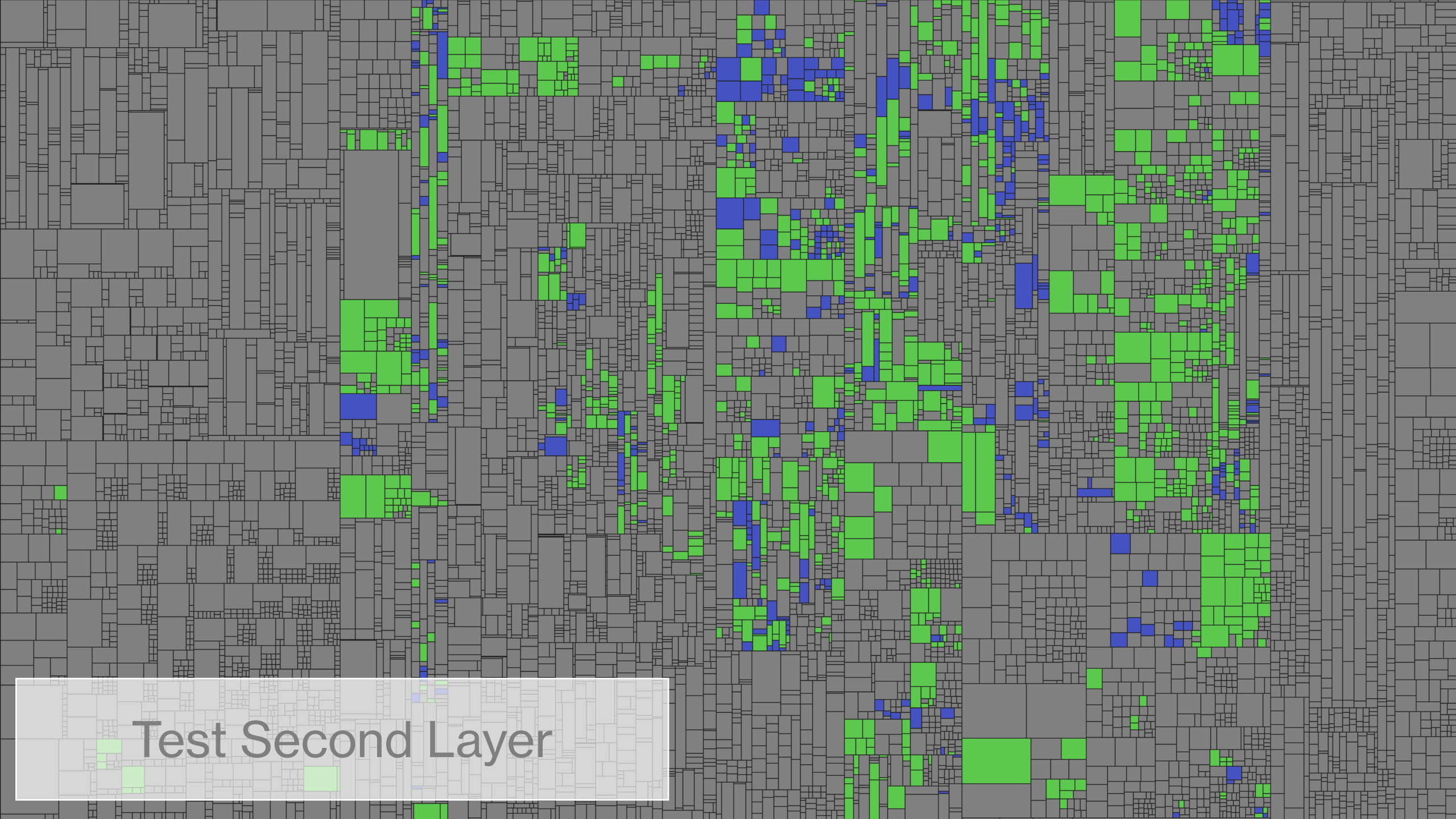




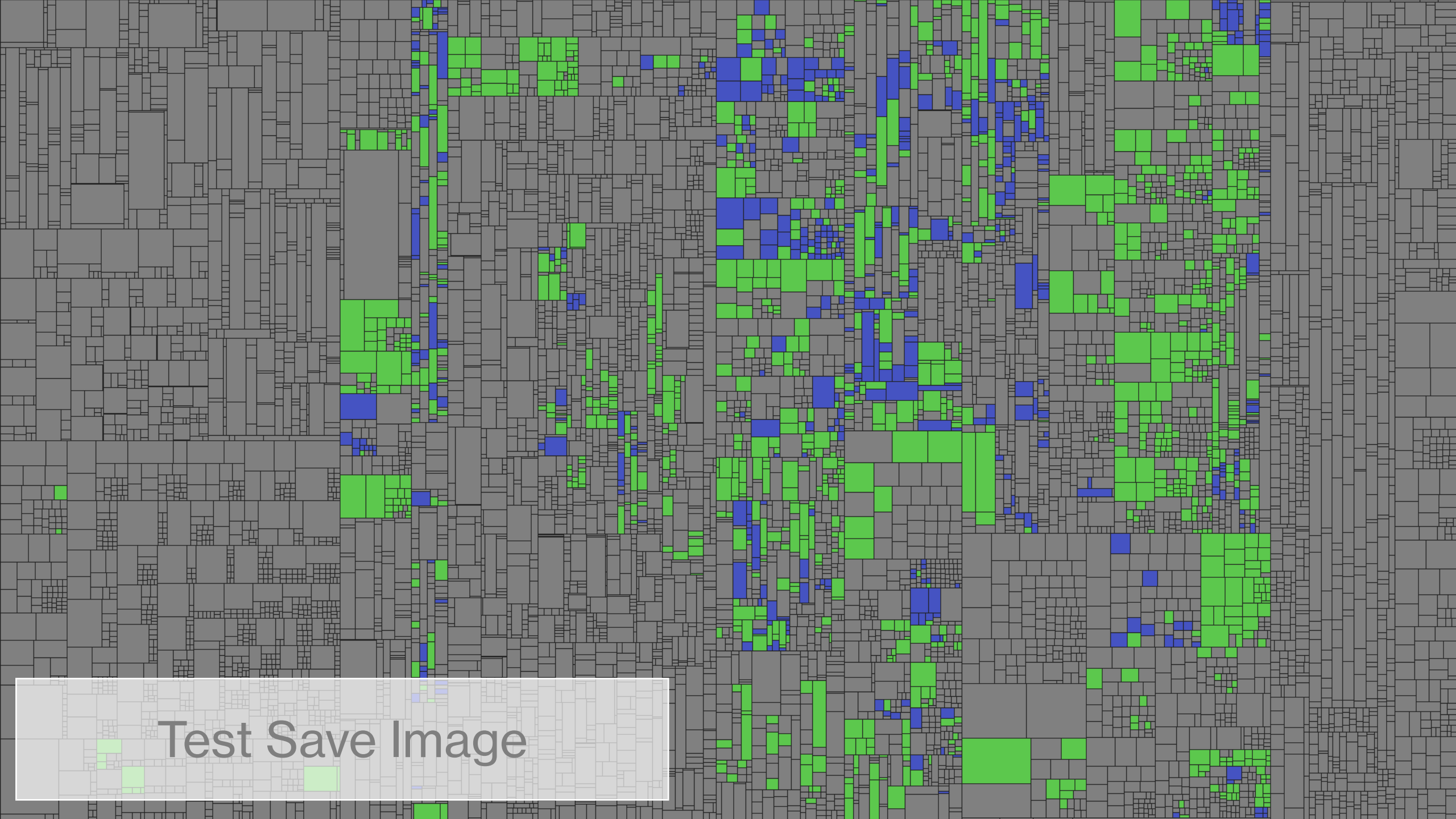
Test Create and Modify
Selection



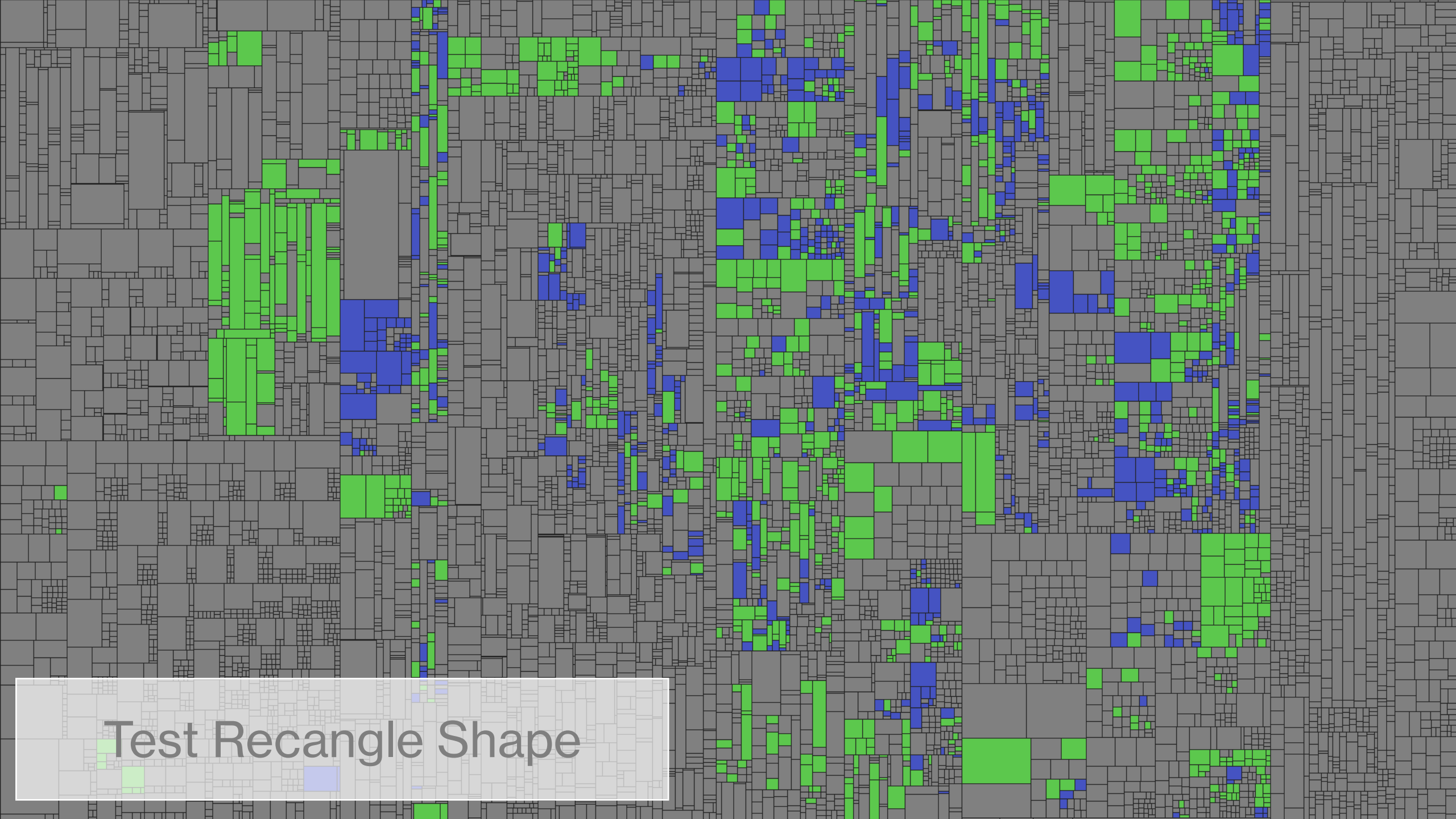
Test Change View Settings



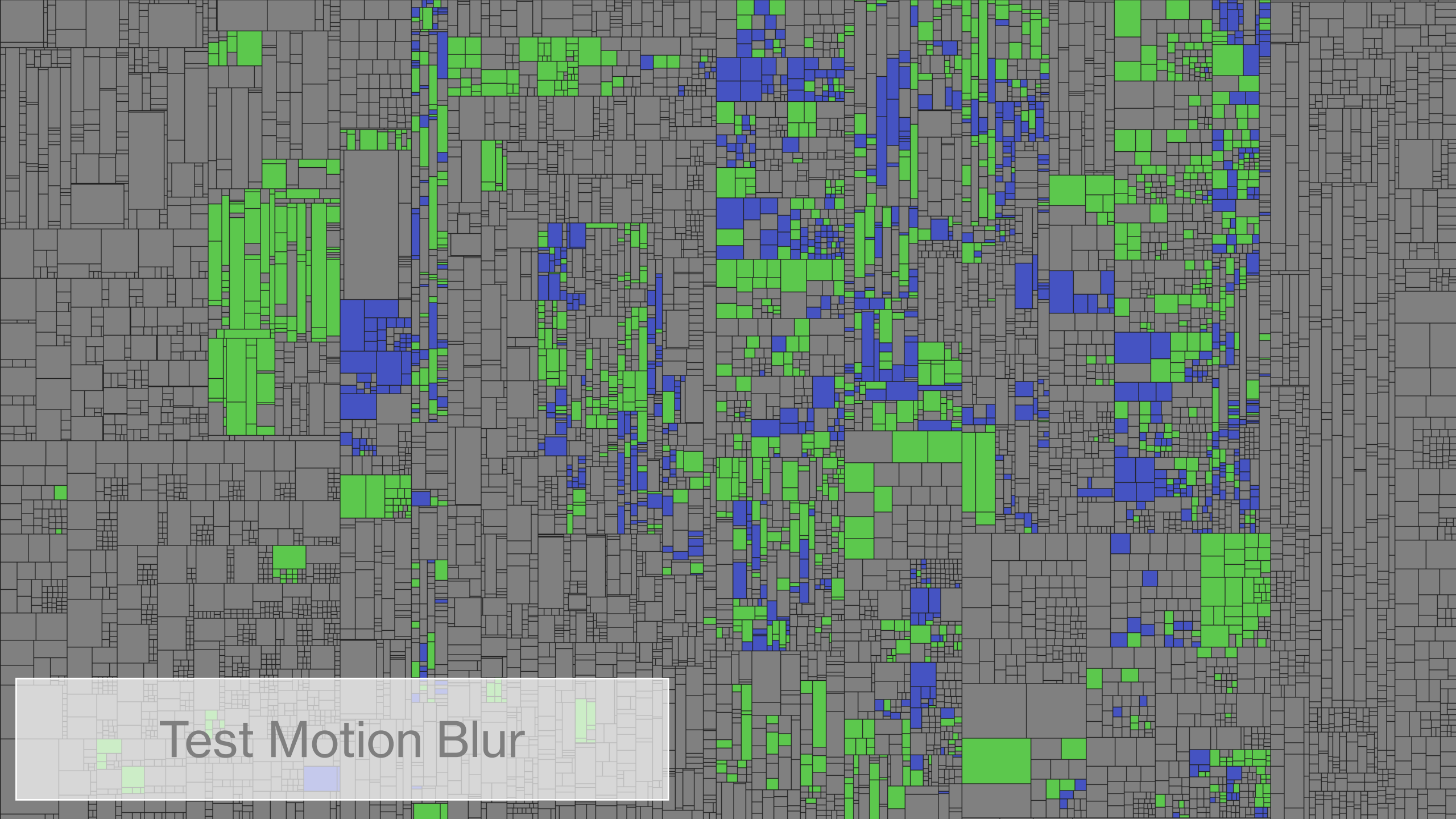
Test Second Layer



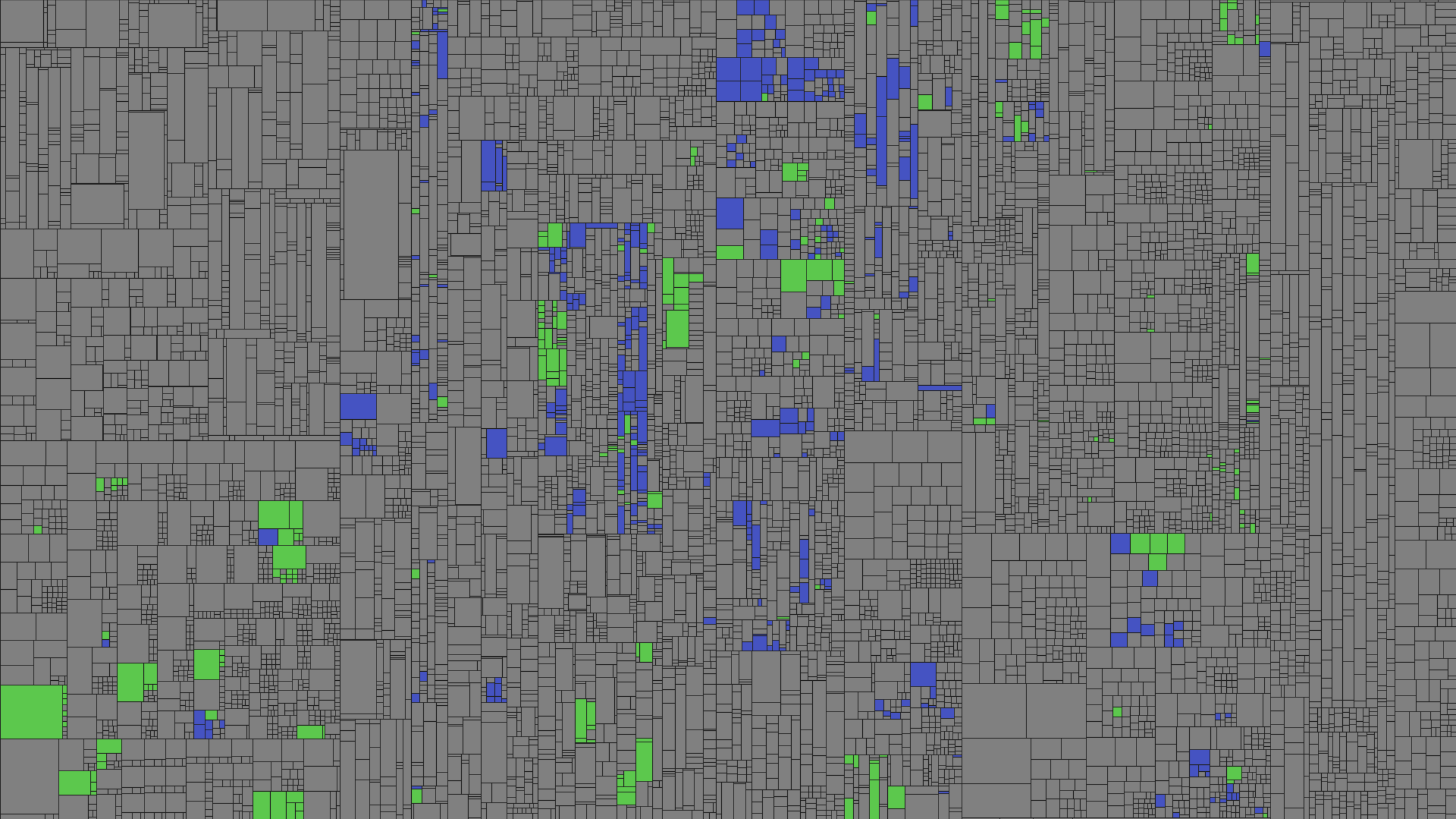
Test Save Image

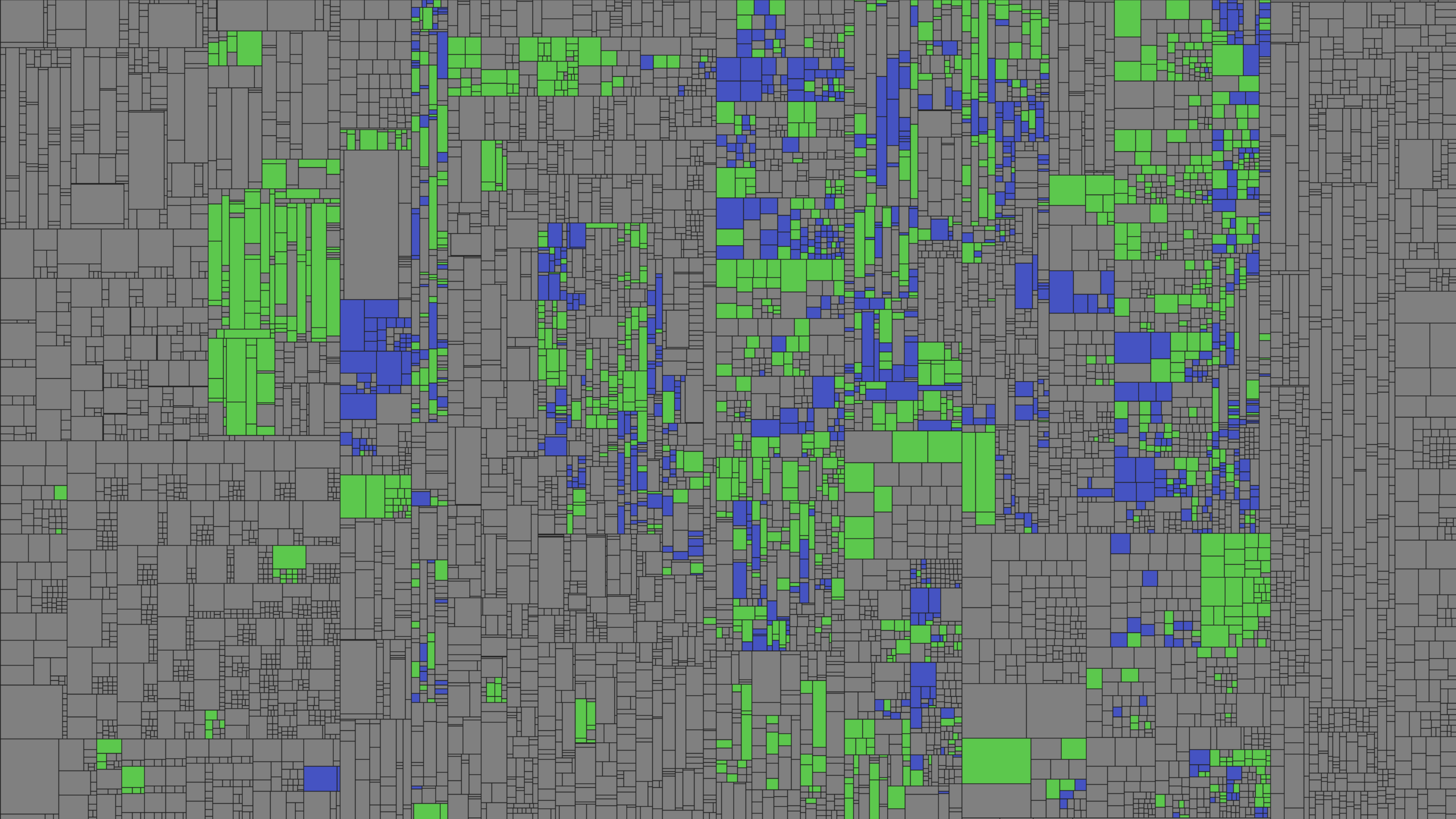


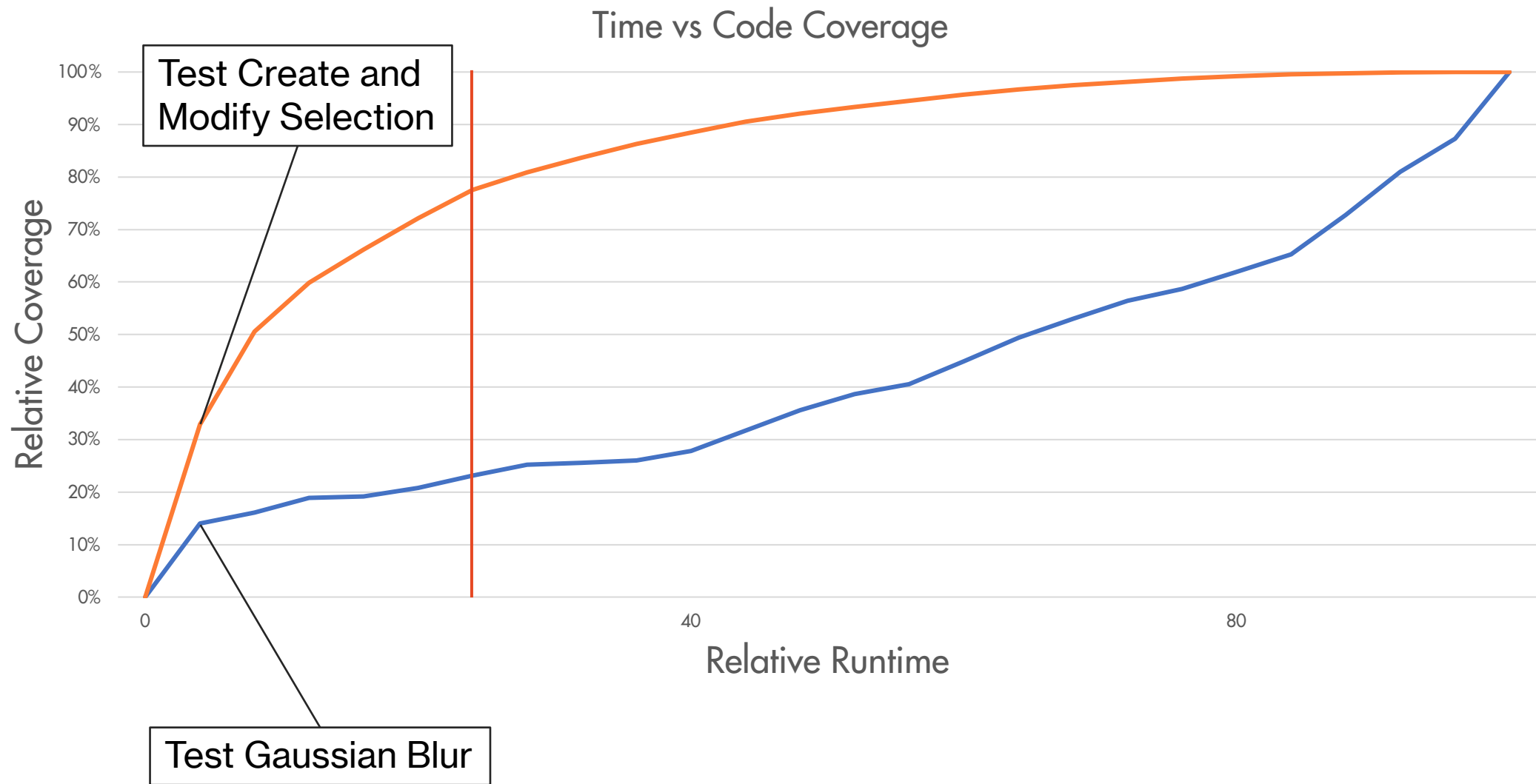
Test Recangle Shape



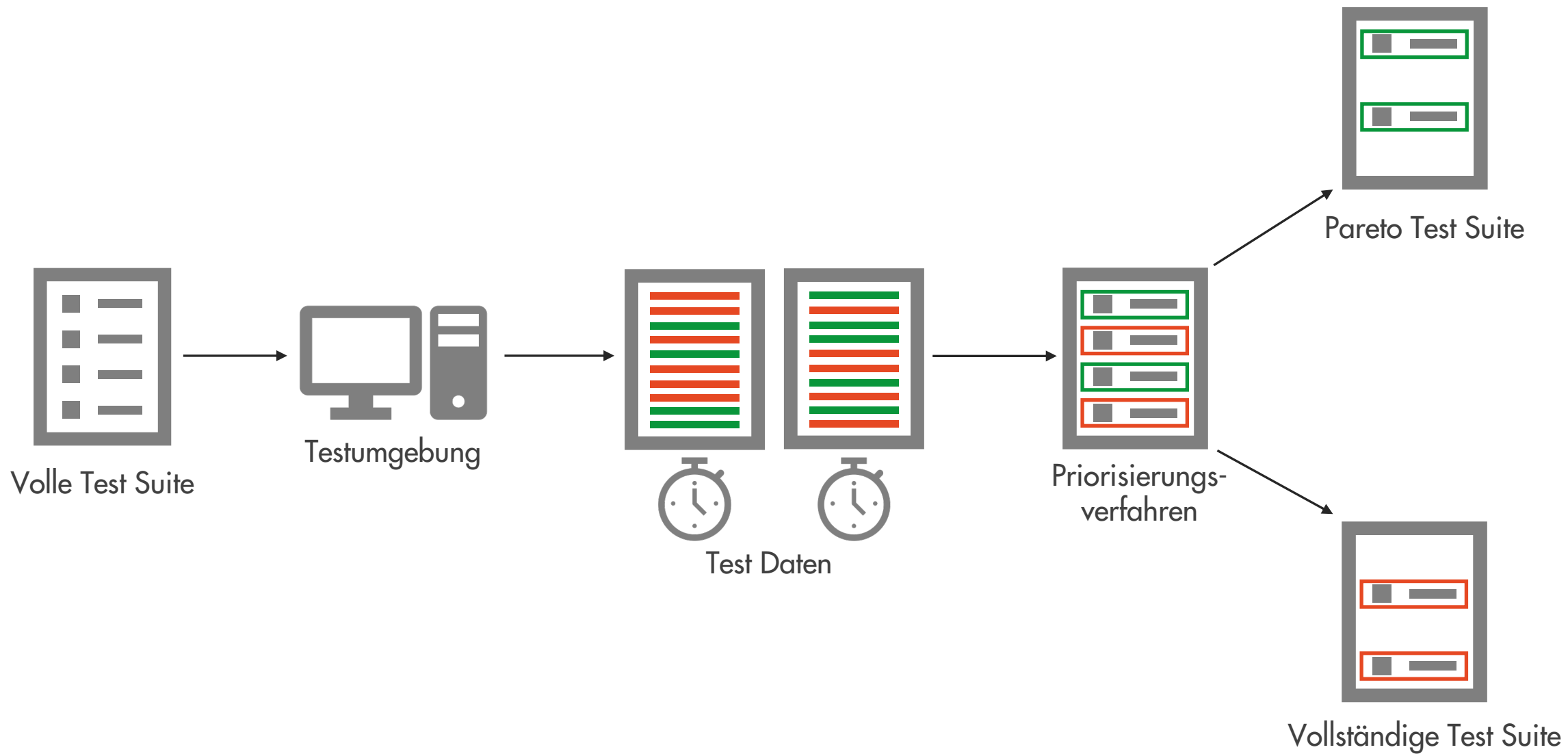
Test Motion Blur







Wie wählen wir die besten Tests aus?



Code Coverage

- So viel Code wie möglich abdecken
- Geringerer Wert nach erster Abdeckung

Ausführungszeit

- Schnellere Tests werden bevorzugt

Lokalität

- Tests die weniger verschiedene Klassen Abdecken werden bevorzugt

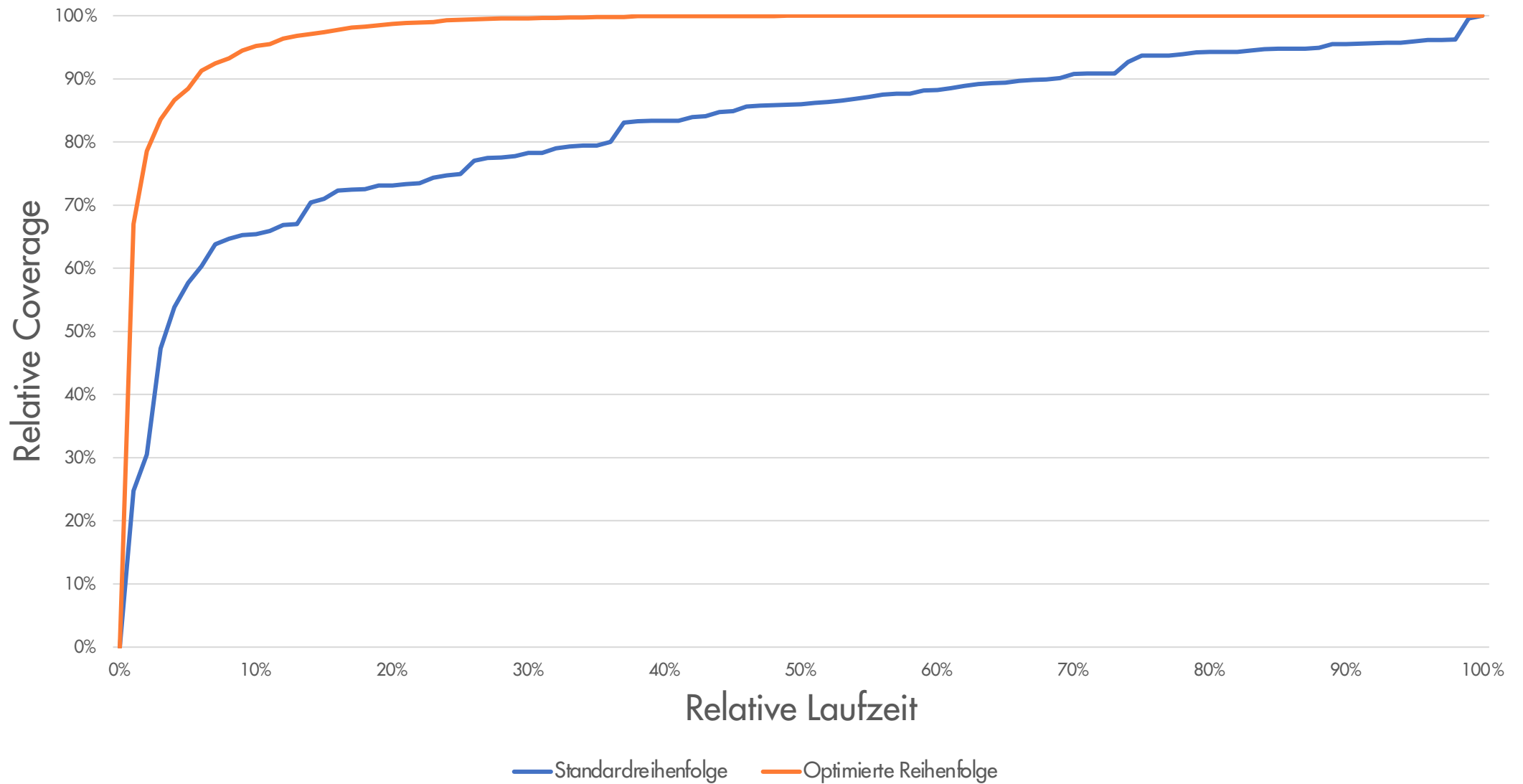


Potentielle Einschränkungen in der
Ausführungsreihenfolge

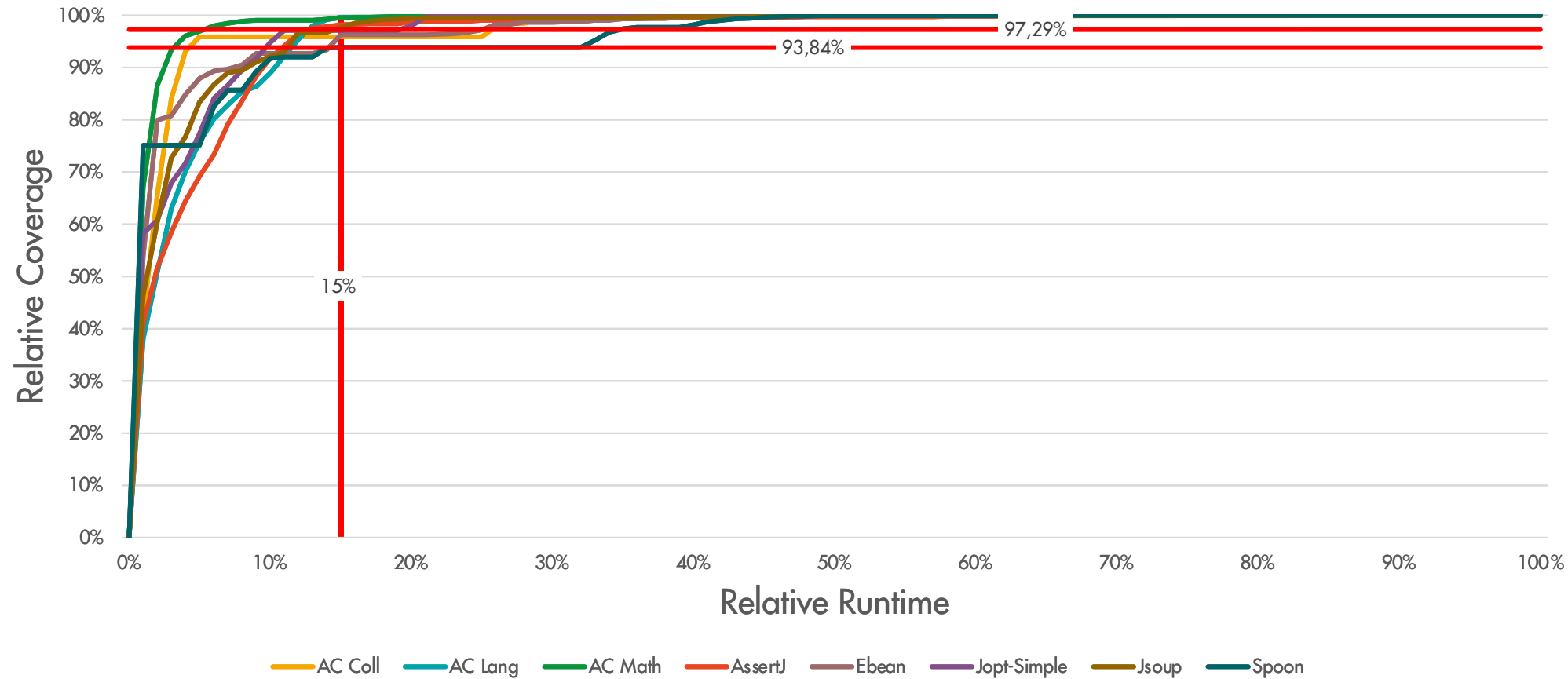
Wie gut funktioniert das ganze für echte Test Suites?

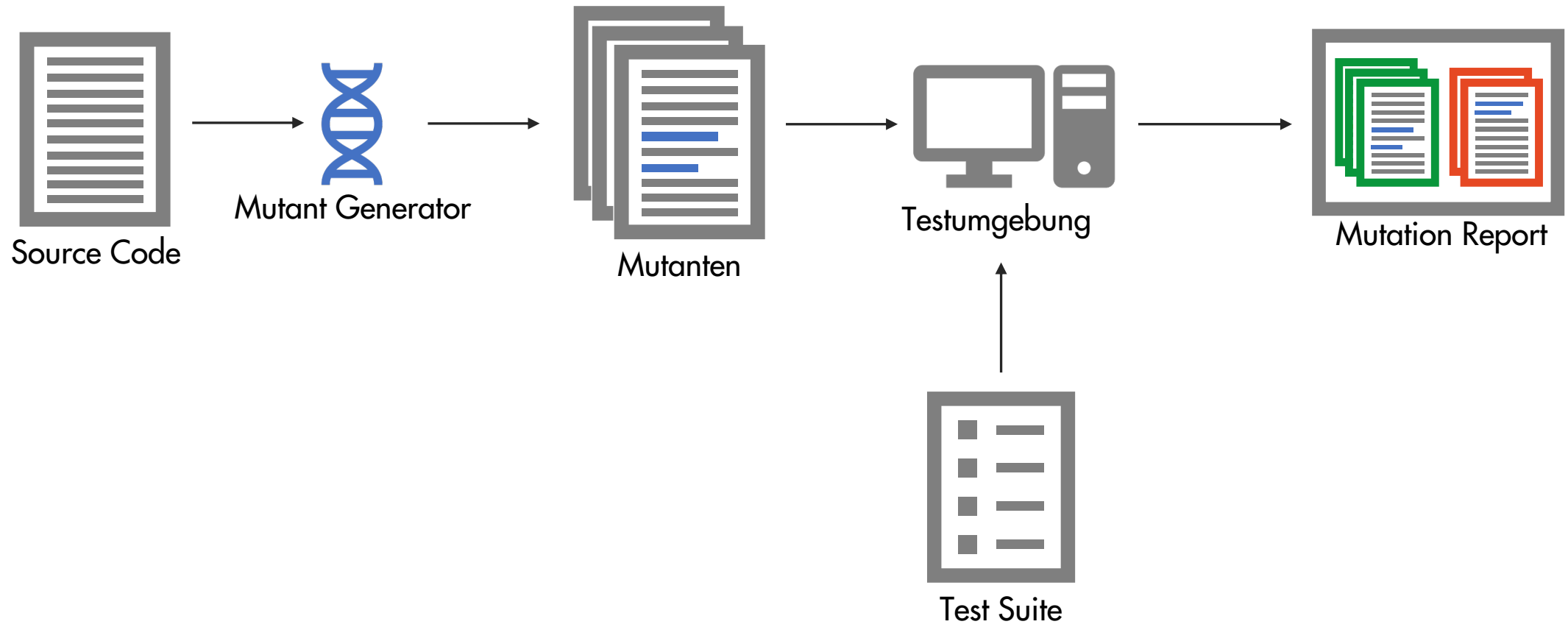
Open-Source Project	SLOC	# Tests	Code Coverage
AC Collections	62,934	15,183	86%
AC Lang	75,467	3,484	95%
AC Math	174,522	4,828	92%
AssertJ	161,306	14,685	91%
EBean	170,656	2,618	77%
JoptSimple	9,433	838	98%
Spoon	112,650	1,619	83%
Closed-Source Project			
Siemens	>>203,964	5,366	75%
CQSE	516,949	2,979	76%

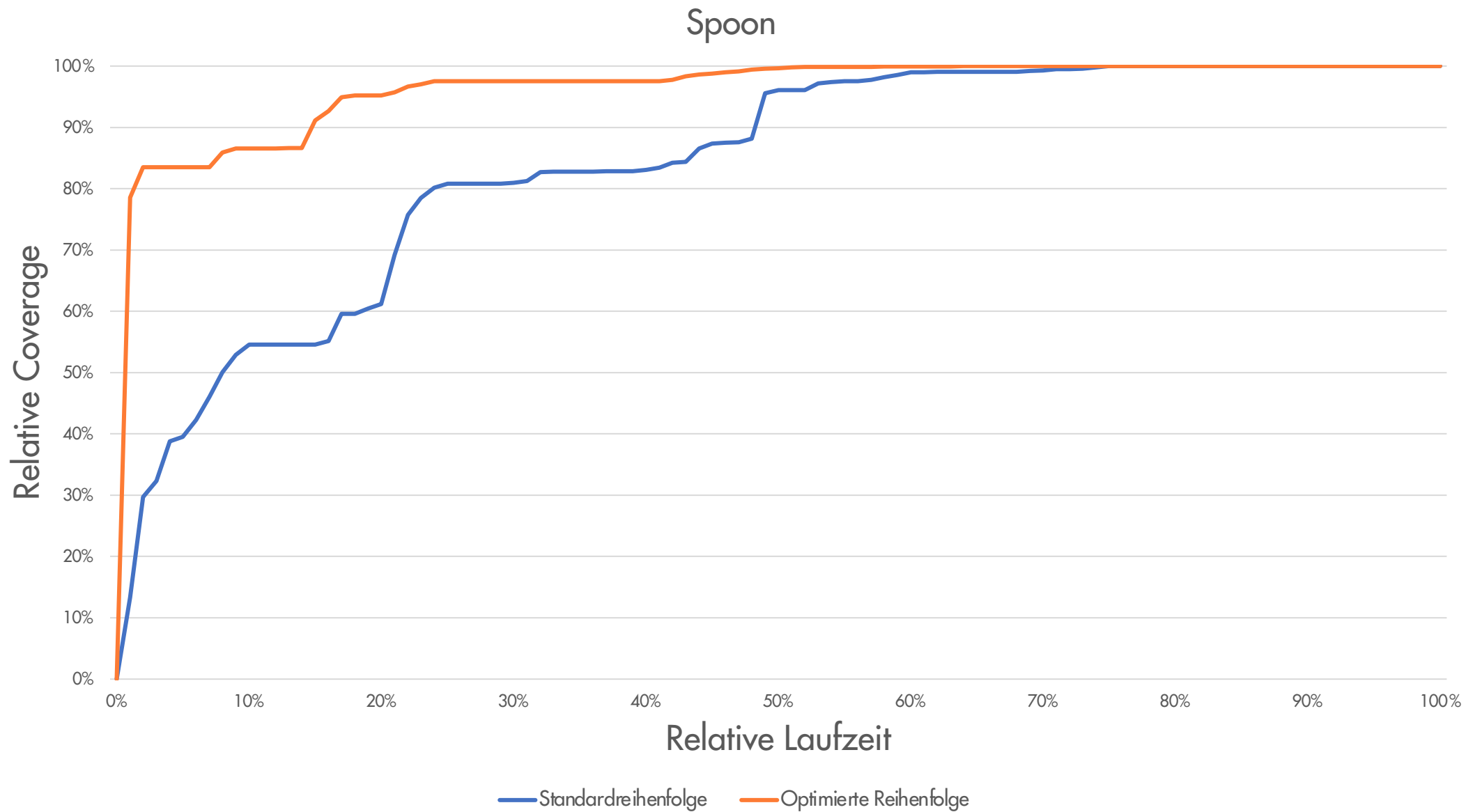
Siemens Projekt



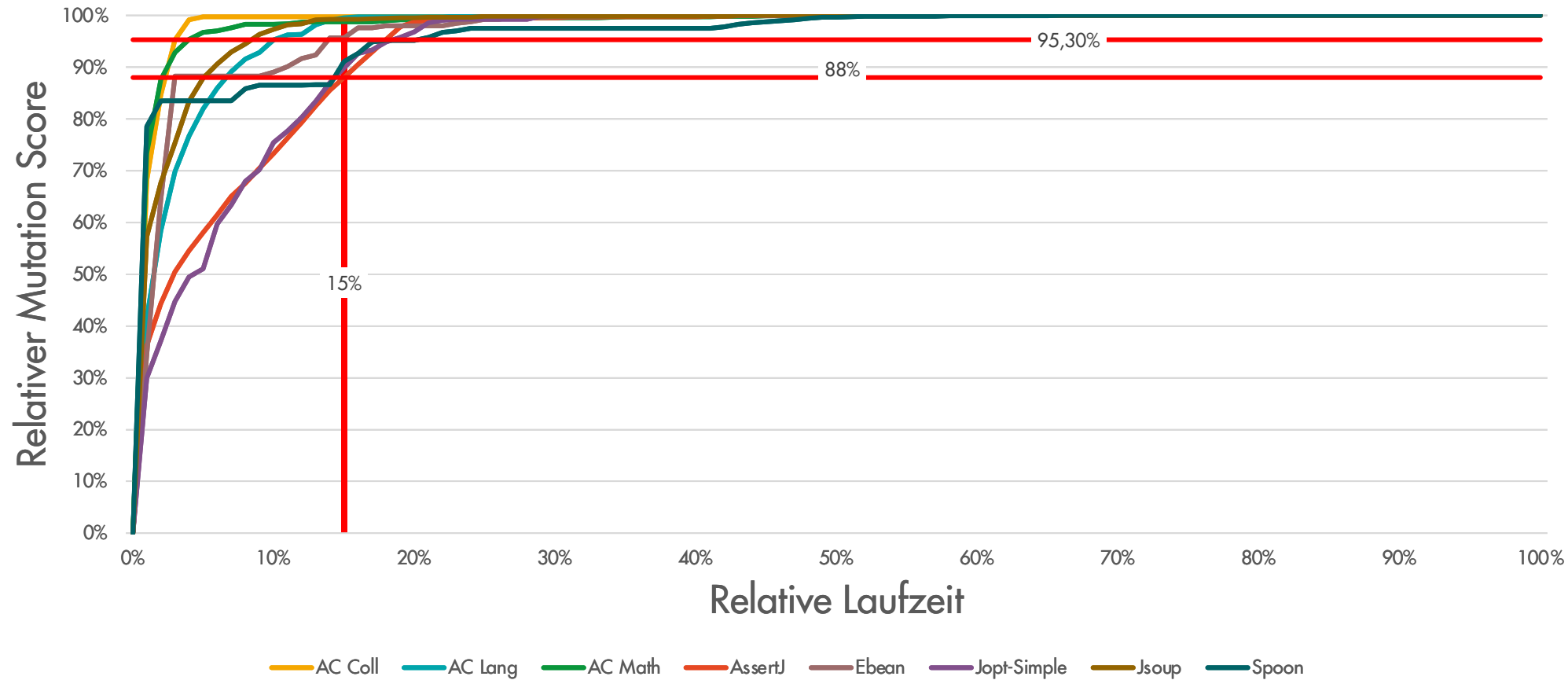
Überblick







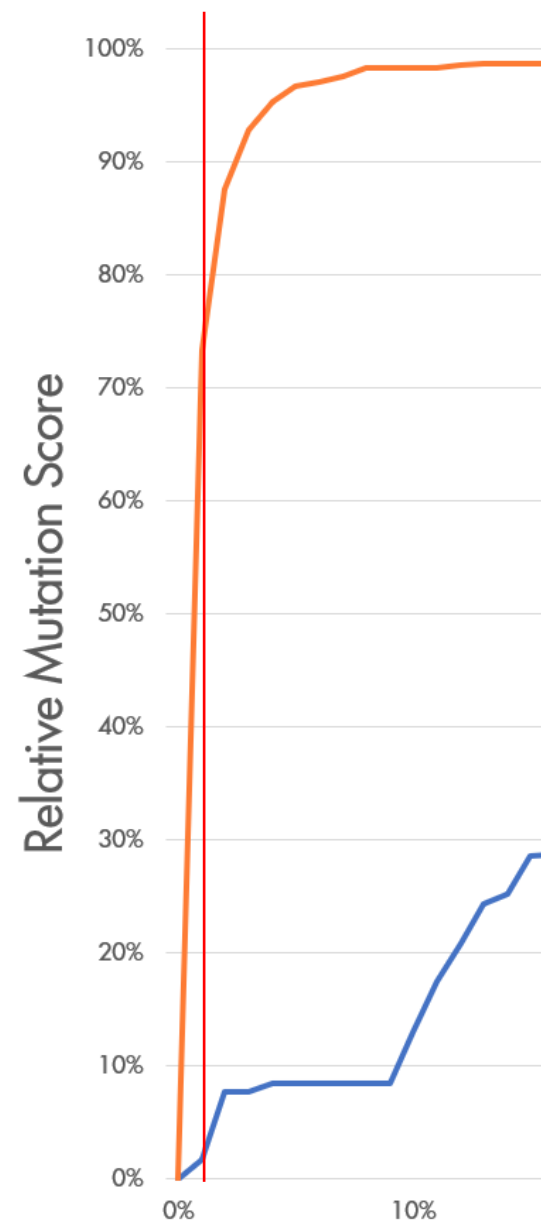
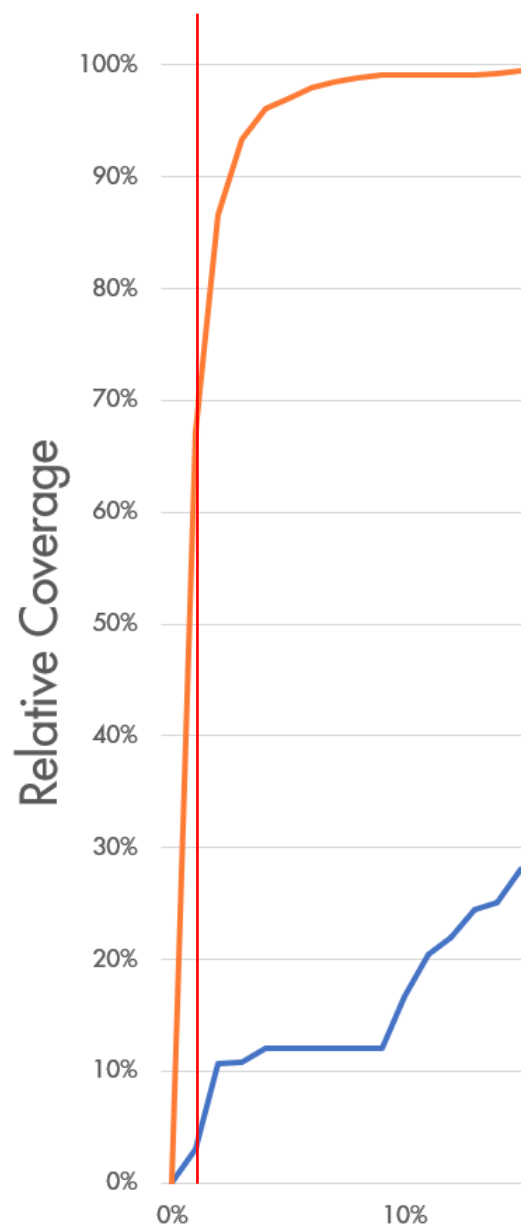
Überblick



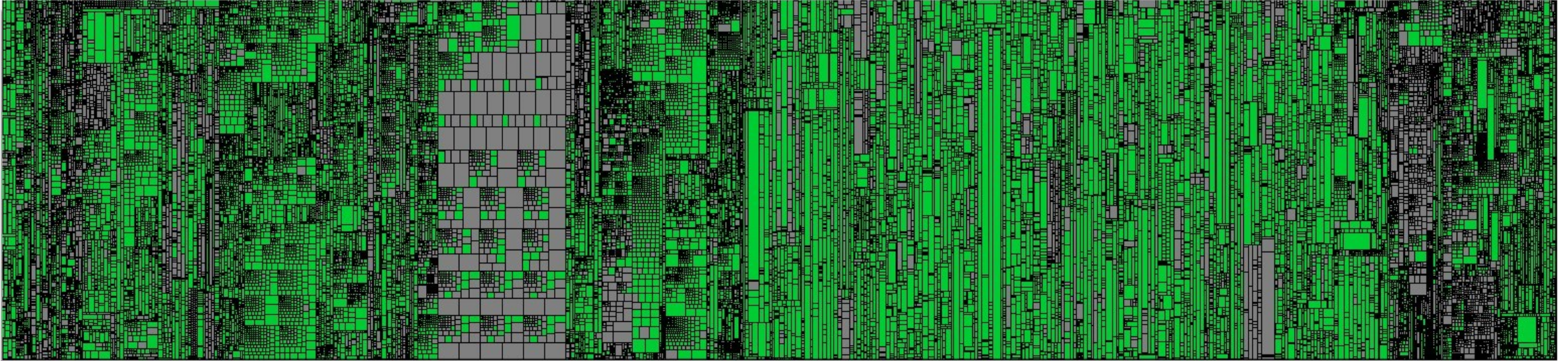
Fazit

- Über 95% der coverage und Mutanten in 15% der Zeit
- Je ineffektiver die Test-Suite, desto stärker ausgeprägt der Effekt
- Anwendbar auf automatisierte und auf manuelle Tests

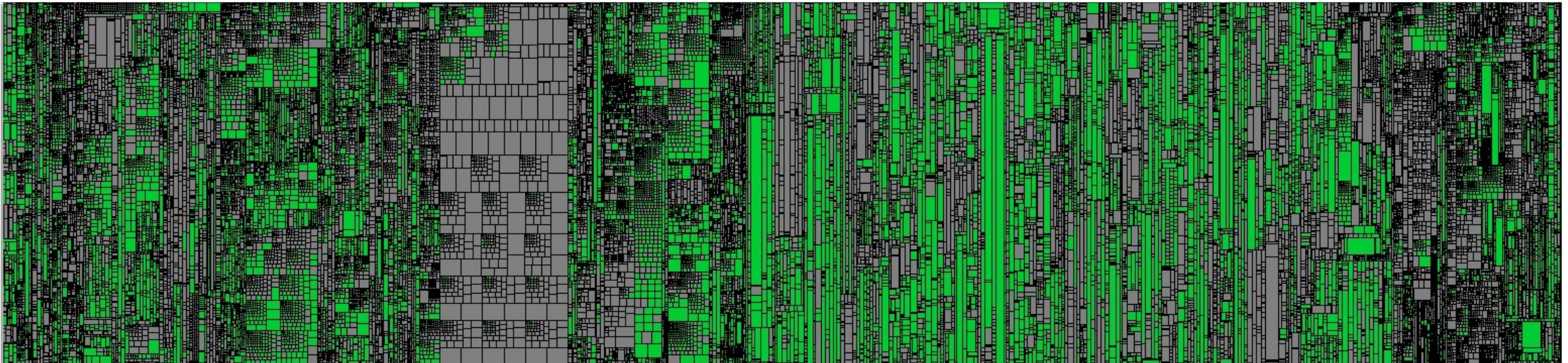




400+ Stunden Testausführung



1 Stunde Testausführung: >50% Coverage



Google Meet - apr-zwcp-ijf7authuser=1

meet.google.com/apr-zwcp-ijf7authuser=1

👍

👤

⚙️

🔊

👤

💬

👤

...und der Rest
des Teams
natürlich auch!

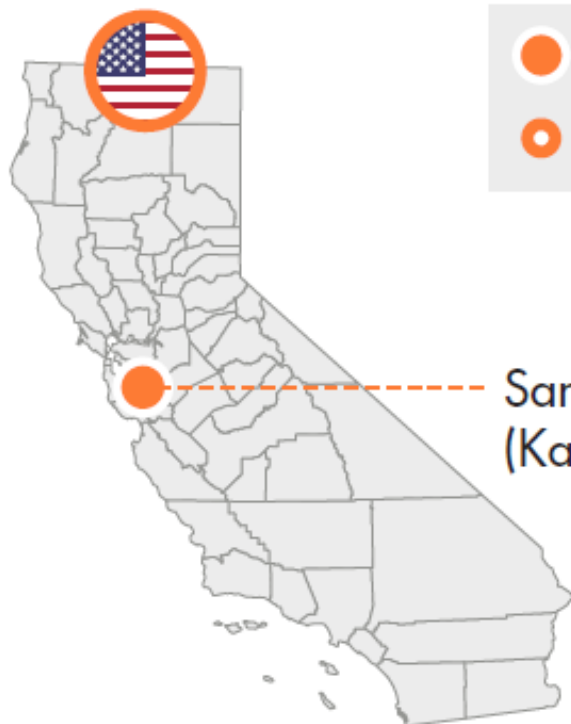
CQSE im Homeoffice

🔊

📞

🔴

Bildschirm teilen



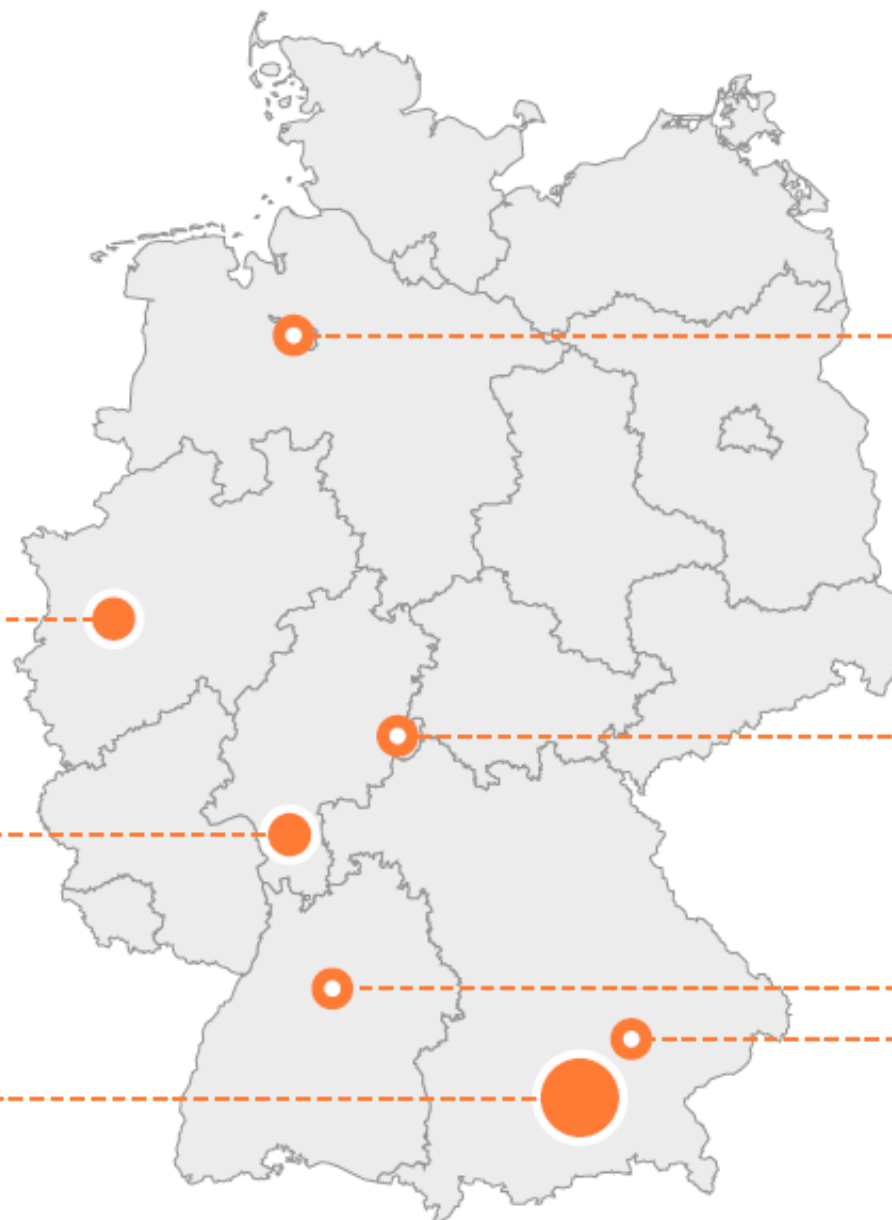
- Offices
- Home-Offices

Santa Clara
(Kalifornien)

Ratingen

Darmstadt

München



Bremen

Fulda

Stuttgart

Landshut

Wir freuen uns auf Diskussionen 😊



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