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Faculty Summit

10
YEAR ANNIVERSARY

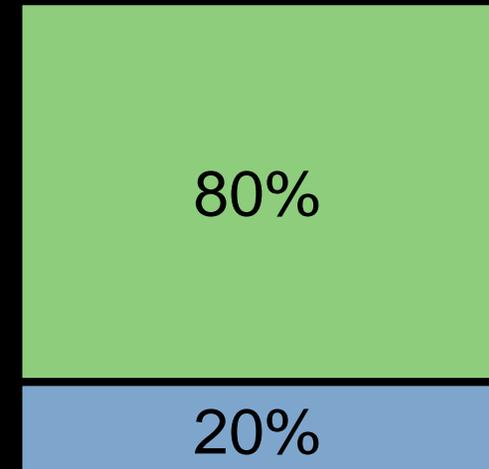
Lifting the Energy Veil

A plea for data and science

Philip Levis
Computer Systems Lab
Stanford University

Amdahl's Law Extended

- Costs bound benefits
- Corollary: optimize the big cost
- Death of a thousand cuts?



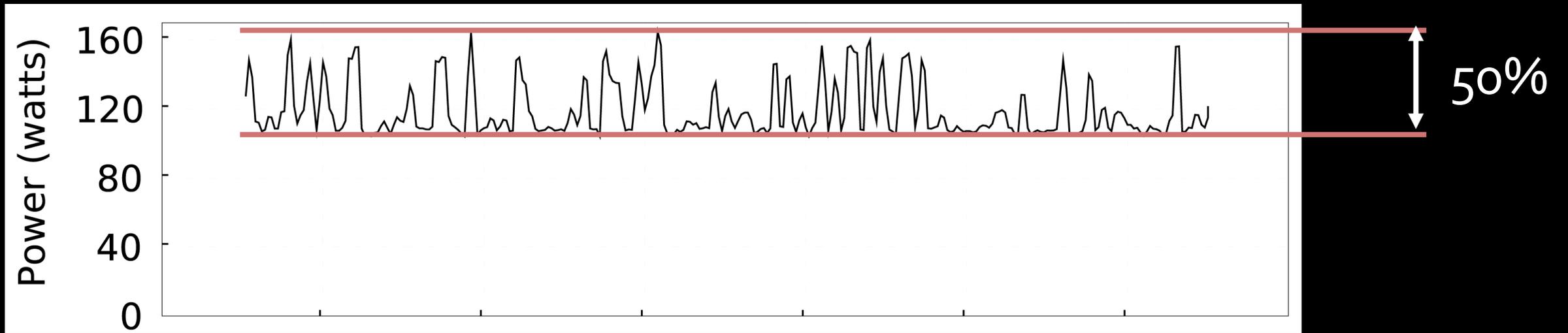
Streetlights



?

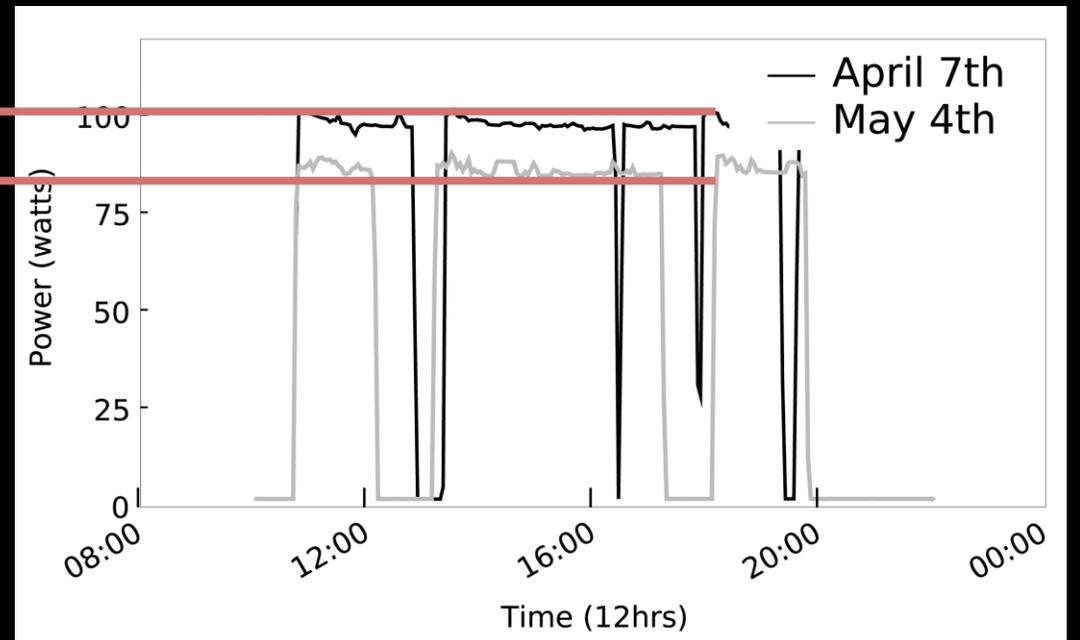
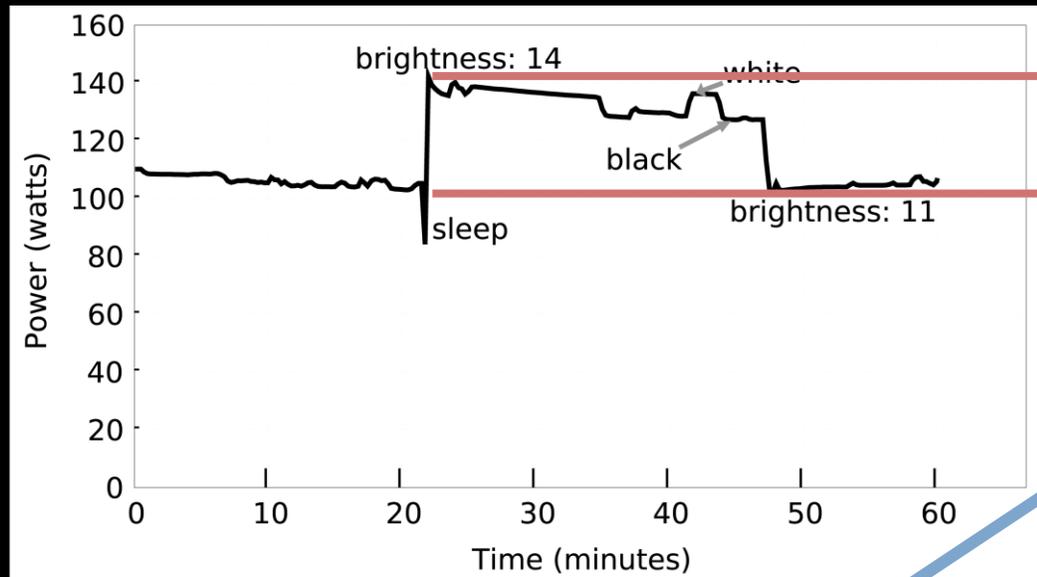


Well-Lit CPUs



In practice, a 3-5% improvement is achievable.

Contrast: Displays



In practice, a 20% improvement is achievable.

It's No Wonder....

Bill Dally, Chief Scientist, NVIDIA

The issue is that people don't realize all of the options in the design space. You can't get current arbitrarily low.

Krisztian Flautner, Director of Advanced Research, ARM

You could have lower power RAM, but engineering it is expensive and the market

Paul Kimelman, chief architect of ARM Cortex M3

I think you will find that a part designed to run at 50MHz and above with 64K of SRAM will always draw more power in sleep mode.

vestment.

Data is Truth

- Separate artifact from essence
 - (addressing either is commendable)
- “Interesting” is a bad word
- Open, public data sets