

A thick black L-shaped frame is positioned around the text. It starts at the top left, goes right, then down, then right again, and finally down to the bottom right corner.

ETHICS IN COMPUTER BENCHMARKING

Jonathan Flum

What is benchmarking?

- Real world performance evaluation of a computing system
 - *Processing speed*
 - *Memory/storage capacity*
 - *Battery Life*
- Assists consumers in determining value
 - *Ultimately influences purchase*



Why is this important?

LAPTOP BRAND	CPU	RAM/HDD	BATTERY LIFE	PRICE
“Samsung”	2.5 GHz	8G/1TB	4 hours	\$599
“Lenovo”	2.5 GHz	8G/1TB	6 hours	\$599
“Acer”	2.5 GHz	8G/1TB	5 hours	\$599
“Toshiba”	2.5 GHz	8G/1TB	12 hours	\$599

But... are Toshiba’s claims accurate?

Why make false claims?

- Not “made up” specifications:
 - *Technically accurate, but...*
 - *Not representative of intended use*
- Misleads consumer
 - *False sense of value*
- Persists due to marketing advantages/competition



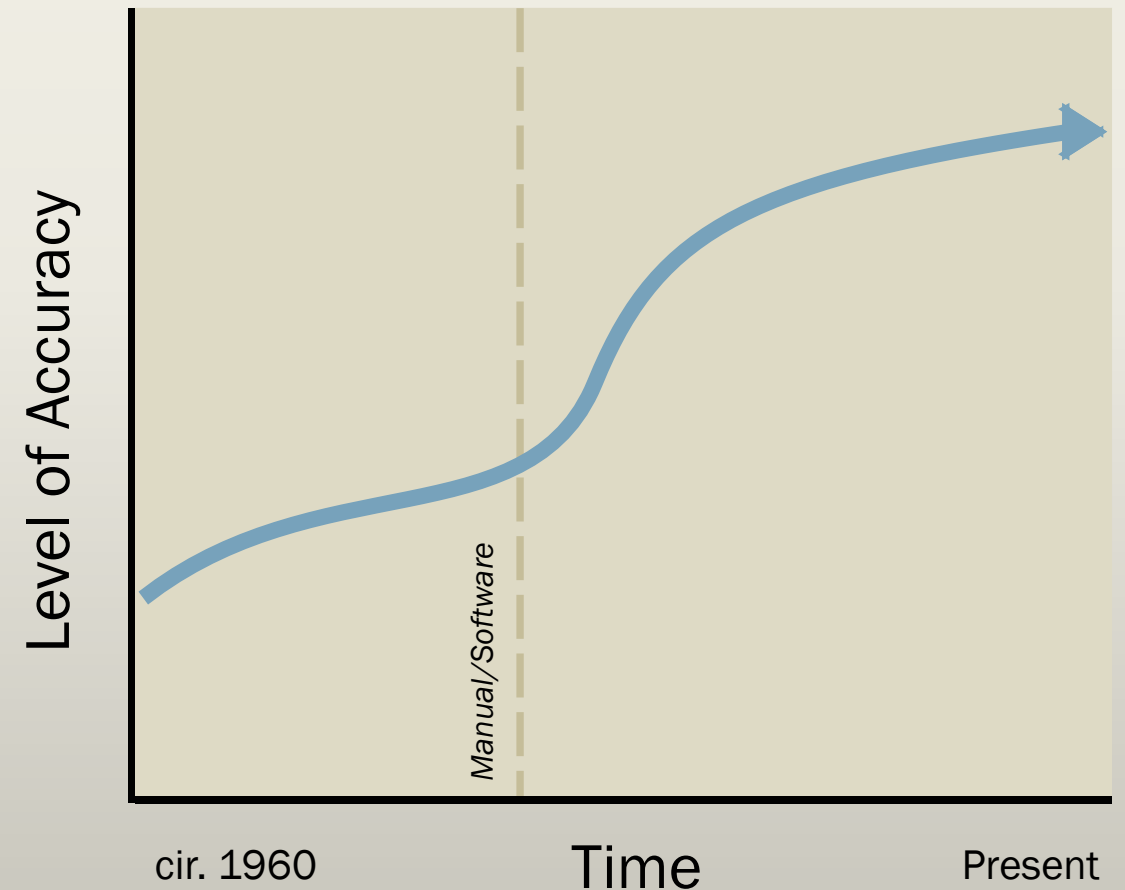
Common Exploits

- Using out-of-date testing software
 - *Reduces measurement accuracy*
- Computer setting manipulation
 - *Artificially boosts performance*
- Exploitation of software flaws
 - *Produces biased data output*



Evolution of Testing Methods

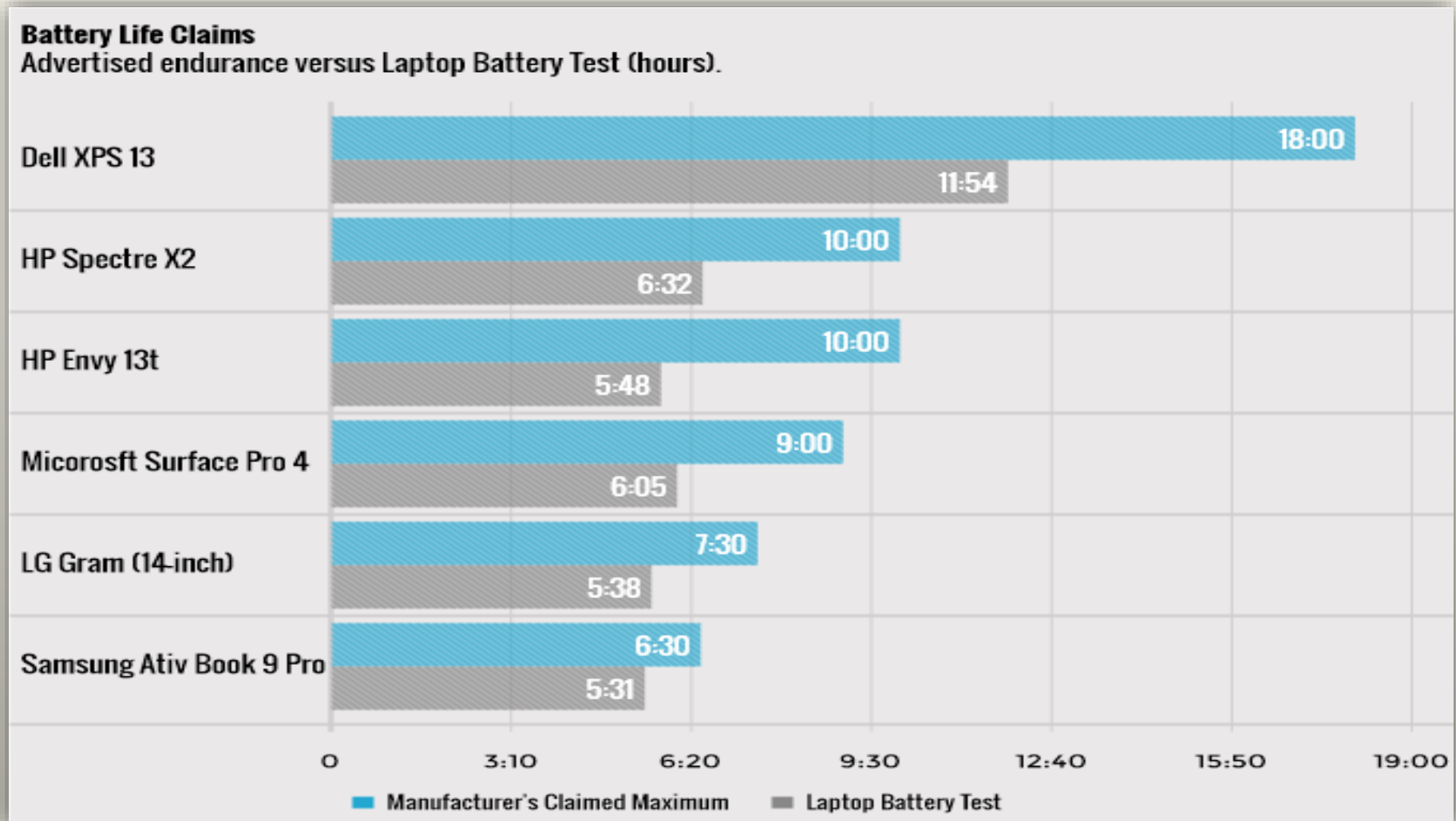
- Process development over 50 years has increased benchmark precision
- Older versions contain greater amount of inaccuracies/assumptions
- Out-of-date software can be utilized to inflate system specifications



Settings Manipulation

- Unrealistic setting adjustment → longer battery life
 - *Minimum screen brightness*
 - *Reducing screen resolution*
 - *Disabling Wi-Fi, other peripherals*
 - *Relying solely on solid state storage*
 - (Optical drives, physical drives, etc. disabled)

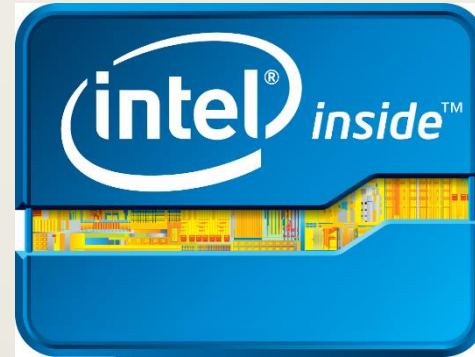
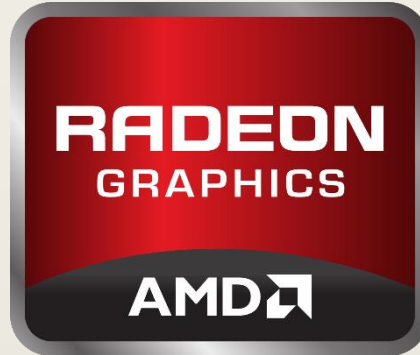
Battery Life Comparison



Cheating Benchmark Software

- Computer code optimized to favor specific benchmarks
 - *Tweaking drivers to ignore certain processes*
 - *Lowering computation accuracy to increase performance*
 - *Process offloading to other areas*
 - *Relying solely on solid state storage*
- Optimization results in higher benchmark score
 - *Has no real impact in real world performance*

Known Industry Culprits



Documented cases, lawsuits, and/or inquiries
over benchmark manipulation

Summary

- Be a wise consumer!
- Look out for:
 - *Inaccurate Performance claims*
 - *Inflated Battery life claims*
 - *Specifications that do not contribute to real world usage*
- Do your own research
- Get the most bang for your buck.





QUESTIONS?