

Ethical Considerations of Benchmarking

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Should we care about ethics?

- Increasing acknowledgement of the societal impact of computer systems.
 - E.g., sustainability has gained traction in both industry and academia.
- Crucial area that has yet to be considered from an ethical lens.

Benchmarking

- Are our benchmark choices perpetuating biases and inequalities?
- Benchmarks can significantly affect final design decisions.

Ethical concerns in benchmarks

1. Lack of diverse workloads.

- Mobile benchmark suites gather popular apps to represent real-world usage and scenarios.

2. Offensive and controversial content.

- The Lenna picture has been extensively used in image processing research.



Aurich Lawson | Getty Image

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2. Offensive and controversial content.
 - The Lenna picture has been extensively used in image processing research.
3. Size and complexity have grown substantially.
 - SPEC CPU 2017 is 2x the size of SPEC CPU 2006.
4. Prioritization of workloads that are important to engineers.
 - Supercomputers are evaluated using linear algebra-based benchmarks.



What can we do?

1: Technical **and** ethical evaluations.

- Performance and energy efficiency.
- Cost-effectiveness, sustainability, accessibility.
- Establish frameworks for benchmark creation and evaluation.



2: Foster diversity in benchmarks.

- Different scientific disciplines and user groups.
- More diverse benchmarks may lead to different designs.



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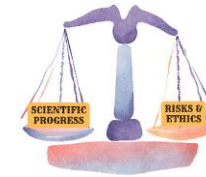
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3: Multi-disciplinary research is necessary.

- Recognize the limits of our expertise as computer architects.
- Engage with experts from different fields.



4: Study the influence of sponsorships.

- Are certain benchmarks used more frequently because they are of greater importance to industry?



We need to increase our efforts

- Several ethical challenges currently in computer architecture benchmarks.

“Broad cultural conceptions of science as neutral entrench the perspectives of dominant social groups, who are the only ones entitled to legitimate claims of neutrality.”

Ben Green, Assistant professor, UMich

I'll be happy to answer your questions.

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