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Tuning the tuner: the art of automatic performance optimization

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Propositions

accompanying the dissertation

Tuning the Tuner: The Art of Automatic Performance Optimization

1. Without standardized methodology and formats, performance research cannot be cumulative; it merely produces isolated anecdotes (Chapter 2).
2. Auto-tuning at scale is infeasible without efficient optimization algorithms (Chapter 5).
3. Manually developing optimization algorithms is obsolete with LLMs being able to do so (Chapter 6).
4. Auto-tuning should be part of any HPC / GPU application development pipeline (this thesis).
5. Reproducibility in computational research requires not only open source code, but also open performance data and experimental methodology.
6. A lot of great software made by computer scientists goes unused because papers are the only metric that matters.
7. Scientific progress increasingly depends on invisible digital infrastructure; failing to invest in its sustainability threatens innovation more than hardware limitations do.
8. Energy-efficient computing is not merely a technical optimization problem, but a societal responsibility.
9. The best computer science jokes are those on recursion (see Proposition 9).

Floris-Jan Willemsen
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