

Einsum Benchmark: Enabling the Development of Next-Generation Tensor Execution Engines

Mark Blacher¹, Christoph Staudt¹, Julien Klaus¹, Maurice Wenig¹, Niklas Merk¹,
Alexander Breuer¹, Max Engel¹, Sören Laue², Joachim Giesen¹

¹University of Jena, ²University of Hamburg

Category	Problems	Tensors	Hyperedges	Hadamards	Traces
Graphical models	10	125–3 692	✓	✗	✗
Tensor network language models	25	38–178	✗	✗	✗
Model counting	50	331–579 972	✓	✓	✓
Quantum computing	32	202–17 136	✓	✓	✗
Random problems	16	53–1 668	✓	✓	✓
Structural problems	21	26–2 000	✗	✗	✗
Weighted model counting	14	358–230 848	✓	✓	✓



generators and converters to create new instances



Contains 168 einsum problems across seven categories



Includes generators and converters to create additional einsum problems



Freely accessible at <https://benchmark.einsum.org>

Contact: mark.blacher@uni-jena.de