

Second MODE Workshop on Differentiable Programming for Experiment Design



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Speeding up differentiable programming with a Computer Algebra System

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In the ideal world, we describe our models with recognizable mathematical expressions and directly fit those models to large data sample with high performance. It turns out that this can be done with a CAS, using its symbolic expression trees as template to computational back-ends like JAX. The CAS can in fact further simplify the expression tree, which results in speed-ups in the numerical back-end.

The ComPWA project offers Python libraries that use this principle to formulate large expressions for amplitude analysis, so that the user has the flexibility to quickly implement different formalisms and can also easily perform fast computations on large data samples.

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