Welcome

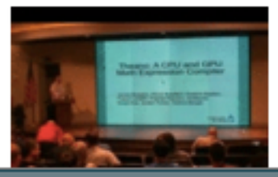
Theano is a Python library that allows you to define, optimize, and evaluate mathematical expressions involving multi-dimensional arrays efficiently. Theano features:

- **tight integration with NumPy** – Use *numpy.ndarray* in Theano-compiled functions.
- **transparent use of a GPU** – Perform data-intensive calculations up to 140x faster than with CPU.(float32 only)
- **efficient symbolic differentiation** – Theano does your derivatives for function with one or many inputs.
- **speed and stability optimizations** – Get the right answer for `log(1+x)` even when `x` is really tiny.
- **dynamic C code generation** – Evaluate expressions faster.
- **extensive unit-testing and self-verification** – Detect and diagnose many types of errors.

Theano has been powering large-scale computationally intensive scientific investigations since 2007. But it is also approachable enough to be used in the classroom (University of Montreal's deep learning/machine learning classes).

News

- Theano 0.8 was released 21th March 2016. Everybody is encouraged to update.
- Multi-GPU.
- We added support for CuDNN v4.
- We added support for CNMeM to speed up the GPU memory allocation.
- Theano 0.7 was released 26th March 2015. Everybody is encouraged to update.
- We support cuDNN if it is installed by the user.
- Open Machine Learning Workshop 2014 presentation.
- Colin Raffel tutorial on Theano.
- Ian Goodfellow did a 12h class with exercises on Theano.
- New technical report on Theano: Theano: new features and speed improvements.
- HPCS 2011 Tutorial. We included a few fixes discovered while doing the Tutorial.



You can watch a quick (20 minute) introduction to Theano given as a talk at SciPy 2010 via streaming (or downloaded) video:

Transparent GPU Computing With Theano. James Bergstra, SciPy 2010, June 30, 2010.