Machine Learning Framework comparisons

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17 May 2020

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Frameworks considered

- Scikit-learn
- TensorFlow (inclusive of Keras)
- PyTorch
- CAFFE

Criteria for selection

- Supports deep learning models
- Documentation
- Support for Python 2.7 (can we switch to Python3? What are the breaking issues if we do so?)
- Ease of implementation
  - Implement on low-powered devices (in case physical size of processor (CPU / GPU) is limited)
  - Support for quantisation

Scikit-learn

- < ver 0.20 supports python 2.7
- Does NOT support GPU-based implementations for neural networks (may be an issue if our implementation involves GPU computation)
- Has easy-to-understand preprocessors (ie. standardization/normalization etc.)

TensorFlow

- Latest version (2.x.x) does not support Python2.7
- Ver 1.14.0 latest supported version
- Has keras implementation (easy to understand deep learning models)
- Documentation is archived on GitHub (not as easily referenced as per their website)
- Supports TFLite – allows for quantisation and reduction in model size

PyTorch

- Latest version (1.5.0) does not support Python2.7 – dropped support for Python2 in 2020
- Ver 1.4.0 latest supported version
- Optimised for GPU-based models
- Ease of distributing computation across cores
- Builtin dynamic graph structure – pythonic syntax

CAFFE

- Has Python2.7 support
- Repo no longer updated (last updated in 2017)
- Less popular framework – searching for sols. can be harder
- Documentation not as concise as others

Conclusion

- (depends on what’s our use case) :)
- Dependent on:
  - Hardware used
  - Whether change to python3 is feasible
  - Familiarity with the frameworks