Deep Fast Vision: Accelerated Deep Transfer Learning Vision Prototyping and Beyond

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1 Introduction

Deep Fast Vision is a Python library optimized for quickly prototyping deep transfer learning vision models. Designed to accommodate both beginners and experienced developers, the library provides varying levels of abstraction. It seamlessly integrates with Keras[1] and TensorFlow[2], offering utilities such as automated determination of loss/target type, streamlined generator setup, automatic configuration of output layers, pre-training of new dense layers with flexibility in unfreezing parts of the transfer architecture, and template-based or custom image augmentation setup. It also ensures that the best weights are automatically saved and retrieved, calculates class weights, and automates plotting of validation curves with emphasis on minimum loss & maximum metric epoch. The library can generate confusion matrices for test/external datasets, supports simple dense layer configuration, multiple regularization options including Dropout, L2, L1, Early Stop, and is compatible with all Keras optimizers and callback support. Comprehensive documentation is accessible both within the provided documentation folder and online at the documentation page.

2 Installation

To integrate Deep Fast Vision into your projects, you can use pip commands such as ‘pip install deepfastvision‘. For compatibility with an older ‘tensorflow-gpu‘, the command ‘pip install deepfastvision[gpu]‘ is recommended.

3 Usage Examples by Abstraction Level

Examples by abstraction level highlight the library’s automation capabilities and configuration options.

For model checkpoint loading and inference, the library allows evaluation mode setup. In this mode, the library performs only evaluation, skipping training. If you provide preloaded weights, the model initializes with those weights for further training or inference.

4 Class Methods

Class methods provided by the library include model prediction, plotting learning curves and extracting learned features.

5 Troubleshooting & Support

The library’s GitHub repository is hosted at https://github.com/fabprezja/deep-fast-vision.

References

1. Chollet, F., et al.: Keras (2015). https://keras.io
2. Abadi, M., Agarwal, A., Barham, P., Brevdo, E., Chen, Z., Citro, C., Corrado, G.S., Davis, A., Dean, J., Devin, M., Ghemawat, S., Goodfellow, I., Harp, A., Irving, G., Isard, M., Jia, Y., Jozefowicz, R., Kaiser, L., Kudlur, M., Levenberg, J., Mané, D., Monga, R., Moore, S., Murray, D., Olah, C., Schuster, M., Shlens, J., Steiner, B., Sutskever, I., Talwar, K., Tucker, P., Vanhoucke, V., Vasudevan, V., Viégas, F., Vinyals, O., Warden, P., Wattenberg, M., Wicke, M., Yu, Y., Zheng, X.: TensorFlow: Large-Scale Machine Learning on Heterogeneous Systems (2015). https://www.tensorflow.org/