



Seminar thesis

# Adversarial Label Flips

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### Abstract

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## 1 Introduction

Example citation [1].

## 2 Background and related work

### 2.1 Attacks

**Existence of adversarial examples** Demonstrated that attacking deep neural networks are susceptible to attacks [2]. They actually coined the term "adversarial examples".

**Fast gradient sign method** [3] developed the fast gradient sign method. They are the guys with the panda image.

**Projected gradient descent** The projected gradient descent, which is basically iterated FGSM, was first shown in [1]. Their experiments suggest that these attacks converge, i.e. they find a local maxima. This may require some restarts.

**Foolbox** A Python library with lots of attacks [4]. They include the attacks above.

### 2.2 Neural networks

[5] demonstrated the effectiveness of deep convolutional neural networks (on ImageNet).

**ResNets** Paradigm shift in deep learning. In [6] they developed Residual Networks to train very deep neural networks. We will probably use ResNet18. If we do, we probably also cite [7] for the "pre-activation" optimization. This is just a better architecture obtained by having BatchNorm-ReLU-Weights blocks instead of Weights-BatchNorm-ReLU blocks.

## References

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- [2] Christian Szegedy, Wojciech Zaremba, Ilya Sutskever, Joan Bruna, Dumitru Erhan, Ian Goodfellow, and Rob Fergus. Intriguing properties of neural networks. In *International Conference on Learning Representations (ICLR)*, 2014.
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- [7] Kaiming He, Xiangyu Zhang, Shaoqing Ren, and Jian Sun. Identity mappings in deep residual networks. In *European Conference on Computer Vision*, pages 630–645. Springer, 2016.