Article Title

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Abstract

In this work, we explore the robustness of Salvador's et al. *[11, 2] ingredient generating deep learning model given input images subject to adversarial perturbations. Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah.*

1. Introduction

Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah.

Blah blah blah blah blah blah blah blah blah blah. [5, 12, 11]. Blah blah blah blah blah blah blah blah blah blah. [11] Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah.

Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah.

1.1. Related Work

Blah blah blah blah blah blah blah blah blah bla [5]. Blah blah blah blah blah blah blah blah blah blah [12]. Blah blah blah blah blah blah blah blah blah [10]. Blah blah blah blah blah blah blah blah blah.Blah blah blah blah blah blah blah blah blah.Blah blah blah blah blah blah blah blah blah.

Blah blah blah blah blah blah blah blah blah blah [11]. Blah blah blah blah blah blah blah blah blah blah [13]. Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah.

Blah blah blah blah blah blah blah blah blah blah [11] Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah.

1.2. Data

Blah blah blah blah blah blah blah blah blah blah [11]. Blah blah blah blah blah blah blah blah blah blah 1. Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah.

Partition	Images	Number of Recipes
Training	252,547	720,639
Validation	54,255	155,036
Test	54,506	154,045
Total	361,308	1,029,720

Table 1. Number of samples by partition for Recipe 1M Dataset.

2. Approach

Blah blah blah blah blah blah blah blah blah blah [11, 2]. Blah blah blah blah blah blah blah blah blah blah [9]. Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah.

Blah blah blah blah blah blah blah blah blah blah (fig. 1). Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah. Blah blah blah blah blah blah blah blah blah blah.

- **Gaussian Blur** using `OpenCV` library [1], this filter blurs an image by applying $n \times n$ sized kernel filter across the entire image. Higher the kernel size leads to more blurring effect. We modified the filter from 3x3 to 45x45.

- **Salt & Pepper** [8] applies image degradation by randomly updating the pixel values to be 0 or 255. Overall extent is controlled by the percentage of pixel on which the noise is applied. We modified the percentage from 1 percent to 90 percent.

- **Gaussian Noise** is a type of statistical noise that has a probability density function that's equivalent to the Gaussian distribution

  $$X \sim \mathcal{N}(\mu, \sigma^2)\,.$$

  and is additive. We added noise with mean of 1 and variance of 1 to mean of 250 and variance of 50.

- **Poisson** applies a Poisson distributed noise across the image and is additive in nature.

  $$\frac{e^{-\lambda}\lambda^x}{x!}$$

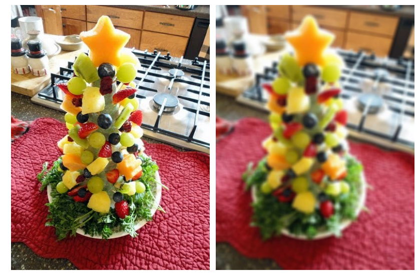
  Lambda was simulated from 1 to 50.

- **Speckle** noise is generated by taking random pixels and multiplying it with a random value. Overall extent is controlled by the percentage of pixel on which the noise is applied. Speckle percentage was simulated from 1 percent to 90 percent

- **Black & White** noise is taking an input image and converting it to black and white. We tried the black and white image with various cutoffs, but eventually applied a cutoff at 127. This means that all the pixels with value less than 127 get updated to 0 and all pixels with value greater than 127 are converted to 255.

- **Style Transfer** following Gaty *et al*. [7] where a feature space generated by 16 convolutional and 5 pooling layers of a 19 layer VGG-Network can be used as an algorithm to create artistic images. We utilized the same style throughout the different sets of models by differentiating the content loss weight. The weight ratio of content weight to the style weight ranges from 0.9 to 5000. These images were generated using a GPU Tesla 4 equipped with 15GB of RAM.

Blah blah blah blah blah blah blah blah blah blah [6]). Blah blah blah blah blah blah blah blah blah blah [12, 11]. Blah blah blah blah blah blah blah blah blah blah [12, 3].



(a) Original (b) Gaussian Blur

Figure 1. Original image and image perturbations.

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3. Experiment: Similarity Effects

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