A GAN based Blind Inpainting Method for Masonry Wall Images

Yahya Ibrahim\textsuperscript{1}, Balázs Nagy\textsuperscript{1,2,3}, Csaba Benedek\textsuperscript{1,2,3}.

\textsuperscript{1}: 3 in PPCU Research Group, Péter Pázmány Catholic University, Esztergom, Hungary;

\textsuperscript{2}: Institute for Computer Science and Control (SZTAKI), Budapest, Hungary;

\textsuperscript{3}: Faculty of Informatics, University of Debrecen, Debrecen, Hungary;
Introduction

- We introduce a novel end-to-end blind inpainting algorithm for masonry wall images, performing:
  - the automatic detection of occluded or damaged wall regions.
  - virtual completion of these regions.
- we propose a three-stage deep neural network.
- For training and testing the network a new dataset has been created.
Introduction

Input

Obtained Mask

Inpainted Output
Proposed method

We propose a blind image inpainting network that consists of three stages:

1) Image Segmentation.

2) Hidden Feature Generator.

3) Image Completion.
Proposed method

We propose a blind image inpainting network that consists of three stages:

1) The U-Net network (encoder-decoder structure) is used at the first stage.

2) The next two stages are based on two different generative adversarial networks (GAN), where each one consists of generator/discriminator substages.
Dataset:

- Our dataset is based on 506 different wall images of size (512 * 512):
- which are divided into:
  - a. The training set (310 images).
  - b. The testing set (196 images).
1. Offline augmentation: 7 modified images are created:
   - a. horizontal flip.
   - b. vertical flip.
   - c. both vertical and horizontal flips.
   - d. adding Gaussian noise.
   - e. randomly increasing the average brightness.
   - f. randomly decreasing the average brightness.
   - g. adding random shadows.
Dataset:
The results
Thanks!

Contact us:
ibrahim.yahya@itk.ppke.hu