

## Image De-Raining

Given an image distorted by rain or snow, you have to extract a clear background image.



For example, given an image on the right half side, you have to extract an image as in the left half side, removing the noise generated by rain in the image.

## Dataset

The dataset has 700 training images. You have to use only these 700 images for training your model. The test dataset will **not** be provided. Once your model is trained, you can give your code with trained weights to us for testing. You can test your model only once a day before final submission.

<https://drive.google.com/file/d/0BzdBpkRAUEzRbW1PYm9KajF5eFU/view?usp=sharing>

## Possible Approaches

1. Use a Deconvolutional Neural network.

Useful links:

<https://www.quora.com/How-does-a-deconvolutional-neural-network-work>

<https://papers.nips.cc/paper/5485-deep-convolutional-neural-network-for-image-deconvolution.pdf>

[https://www.cv-foundation.org/openaccess/content\\_iccv\\_2015/papers/Noh\\_Learning\\_Deconvolution\\_Network\\_ICCV\\_2015\\_paper.pdf](https://www.cv-foundation.org/openaccess/content_iccv_2015/papers/Noh_Learning_Deconvolution_Network_ICCV_2015_paper.pdf)

2. Simulating a GAN using CNNs

Useful links:

<https://arxiv.org/pdf/1701.05957.pdf>

3. Using adaptive non-local means filter

Useful links:

<https://pdfs.semanticscholar.org/d38b/b855efe738481a148f04bd0f3e48ab461129.pdf>

You can use any approach stated or unstated above. But the code has to be in Python. You can use any library for implementation. Possibly stick with Tensor Flow. You need GPUs to run your code. It's better to have a member in your group who has Nvidia GPU inbuilt laptop. You have to install CUDA for running Tensor Flow.

**Evaluation metric**

Your code will be evaluated based on Peak signal-to-noise ratio (PSNR)

[https://en.wikipedia.org/wiki/Peak\\_signal-to-noise\\_ratio](https://en.wikipedia.org/wiki/Peak_signal-to-noise_ratio) . Higher PSNR means higher accuracy of your model.

**Deadline**

You have to submit your code with trained weights before **22nd November, 2017, 11:59 PM**.

You also have to prepare a report on the project in proper IEEE format as given in

[https://www.ieee.org/conferences\\_events/conferences/publishing/templates.html](https://www.ieee.org/conferences_events/conferences/publishing/templates.html).

The project is for **15 marks**.

**Don't:**

- Copy an implementation of the problem from the web or any other individual.
- Try to tweak hyperparameters / train on test set by downloading it from the web.

Any of the above two violations will be reported.