

## Machine Learning Class Project Progress

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### Dataset generation

To generate the dataset for this project I decided to use Blender - open source 3D graphic software. I've picked a ready to use 3D model Mario with creative commons license, set up render with transparent background to PNG and wrote a small python script to render the scene while rotating camera around the object - a sequence of 12 images with step of 30 degrees rotation in horizontal plane . After that, I took 10 CC images from flickr and merged them with rendered Blender output in all combinations using imagemagick batch script. Also, I've created a trimap (basically a mask which marks fully/partly the background and foreground objects on image) manually in a way that it would fit all dataset images. As a result of such approach, from one 3D model and environment 10 photos, in output 120 images were generated.

### Experimenting with CNN models

Since deep CNN seems to be a part of the solution for my problem, I've skimmed several online courses, related to implementing the models:

Machine Learning A-Z

Deep Learning: GANs and Variational Autoencoders

Deep Learning and Computer Vision A-Z

Then I've applied KNN model as a baseline (based on the repo).

I have decided to take VGG16 as a base for my model, since it is trained to recognize objects on images, and that should be very important for the task of sep-

arating foreground object and background objects. The implementation of base VGG16 with loaded weights.

In the end, I've start to implement the model from Deep Alpha Matting paper, which also takes VGG16 as a base of the model.

Next steps

My next steps will be

- 1) finish implementing the deep CNN network for alpha matting
- 2) generate more data from more 3D models and background photos
- 3) train the model and measure performance