

Machine Learning Class Project Proposal

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This idea comes from my work, I had a small research due to estimating a project, where client was interested in cutting background from photo of some object and putting some other background instead. As I've found out, the CV task of this is called Alpha Matting and there are plenty of different ML algorithms which can be used for this, but most precise in latest time was a deep learning approach. As I understand, main issue for using deep learning is to buy/collect/create large enough training dataset - which may cost lot of money or time. But the I've read somewhere that in ML there is another approach to get such data - and is called synthetic dataset generation. Basically it stands for a) taking some real world data unit, and apply some automatic transformation on it many times, thus generating many data units (like making some randomly generated blur on the same photo), or b) fully synthetic data generation by simulating some virtual environment (2D/3D computer graphics, synthetic sound, etc). And then I thought that this may also work for an Alpha Matting task: I can use some 3D graphic creation platform with automation support, generate some random objects and then render them into 2D with different environment (lightning, material) and camera (rotation, transition) settings, with a pair for each render: one with background (which may be also different) and one without background. Those pairs, I believe, can be used to train deep learning network to successfully accomplish Alpha Matting task.

I'm asking for advice, which steps I can do for the next milestone - may be a recommendation for an online courses, books, papers to study the field or any other recommendations. Thank you.