Project proposal

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Proposed title: Depth analysis of a single RBG image with deep convolutional networks.

Brief description of project: The main aim is to recreate the result from "Learning Depth from Single Monocular Images Using Deep Convolutional Neural Fields" [1], starting with the method proposed by the authors and try to extend the analysis; for example examine how image compression affect the result. In short, this method uses a deep CNN to learn the unary and pairwise potentials a continuous CRF (conditional random field). The quality of the networks are measured by the accuracy and mean squared error in the same way as in the article.

Dataset: NYU Depth Dataset V2

Software packages: We intend to use TensorFlow.
Initial experiments:

- Replicate the experiments "Learning Depth from Single Monocular Images Using Deep Convolutional Neural Fields" from [1] and try to achieve similar results.
- Testing the network compressed images.
- Examine image features which makes a picture difficult for the network to process correctly.

Aim and potential extra experiments: In order of priority

- Replicate results from "Learning Depth from Single Monocular Images Using Deep Convolutional Neural Fields" [1]
- Identify features which limits the network's performance
- Propose improvements to algorithm to correct for these limitations.

References

[1] G. Lin F. Liu, C. Shen and I. D. Reid. Learning depth from single monocular images using deep convolutional neural fields. *CoRR*, abs/1502.07411, 2015.