AML: Notes on final project

September 7, 2022

- Notes on first paper (Zagoruyko):
  - Many different architectures, maybe use one or two best results and try to reproduce.
  - Very focused on patch matching / segmentation, not sure, how much feature matching (or wide baseline stereo matching) was done in this paper
  - Use of 64x64 patches: Makes it difficult for us to reproduce, since we have full resolution images. We need to decide on a way to pre-process our dataset or implement layers in the architecture that allow us to give different sizes as inputs (SPP layer?).
  - Interesting take on CNNs & NCCs, maybe we could give NCC nerworks a try, since it takes care of the normalization.
  - Could use the Stretcha et al paper/data set to verify our results (comparing Zagoruyko with our network).
  - Doesn't exactly correspond to our task, since output of networks are depth maps and not camera positions. We need some idea to translate depth information to positional info.
  - We don't have the same ground truth as the data sets used in the paper. Our ground truth consists of positional information, not depth $\rightarrow$ can only take inspiration from this, but doesn't solve our problem.
- Notes on "Understanding the Limitations of CNN-based Absolute Camera Pose Regression"
  - main focus und single image based absolute 3D

  - "Image Retrieval" is closest to kaggle winners, since it basically uses the CNN for matching the test image with the most similar training image and using feature matching to estimate the relative position of the 2 images. RPR is basically kaggle challenge

- Some more interesting links:

  - Blogpost with basic info about Task+many useful resources https://ducha-aiki.github.io/wide-baseline-stereo-blog/2020/03/27/intro.html
  - Stretcha, Hansen: 3D reconstruction https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4587706
  - kaggle challenge winners https://ducha-aiki.github.io/wide-baseline-stereo-blog/2022/07/05/IMC2022-Recap.html
  - Sattler, Zhou: Understanding the Limits of CNN...https://arxiv.org/abs/1903.07504
  - Balntas, Li: RelocNet: https://openaccess.thecvf.com/content_ECCV_2018/papers/Vassileios_Balntas_RelocNet_Continous_Metric_ECCV_2018_paper.pdf
  - Laskar, Melekhov: Pairwise Relative Poses with CNN: https://arxiv.org/pdf/1707.09733.pdf´