Restoration and Recognition in a Loop

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Learning Potentials Sampling Recognition Restoration

Recognition and conversion of confidence scores into probabilities: Recognition phase is brought inside the loop to assist restoration and sampling blocks. The recognition scores are fed to the sampler which now samples based on the scores distribution, rather than uniformly.

The interaction between neighboring patches has the maximum effect on the boundary pixels. The yellow half of the left patch influences the red half of the right patch for the two neighbors as shown in the top row. Similar interactions are shown for neighbors with different orientations.

Inference (restoration): Non-parametric Belief Propagation (NBP) [1] is used for inferring the unknown sharp image. NBP is used in conjunction with alternating Gibbs sampling [2] and kernel density estimation with cross-validation.

Results

Synthetic Test images

Confidence scores of the digit classes, before and after restoration

Deblurring of real license plate images

References: