CONTEXT-AWARE AUTOMATIC OCCLUSION REMOVAL

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MOTIVATION
- Existing image enhancement techniques for occlusion removal:
  - Domain-specific. E.g., shadow removal, image de-raining
  - Require manual-annotation.
- No work tries to capture occlusions based on image context.

CHALLENGES
- How to capture image-context in a generic domain?
  - Highly varying and complex.
  - Subjective in human perception, required to be captured objectively.
- How to evaluate?
  - No baseline.
  - No dataset annotating image-context and respective occlusions.

PROBLEM FORMULATION
- Making intelligent decisions:
  - Identifying image context based on background and foreground objects.
  - Detecting objects not related to image context as occlusions.
- Producing a visually-pleasing output:
  - Replacing the pixels related to occlusions coherently.

IMPLEMENTATION
- Annotations used to train sub-networks:
  - Foreground Segmentator - foreground segmentations.
  - Background Extractor - background class labels.
  - Relation Predictor - image captions.
  - Inpainter - images and random masks.
- Original corpus vs. modified corpus of image captions for Relation Predictor.
- Random masks for Inpainter.

CONCLUSION
- We establish a baseline for context-aware automatic occlusion removal in a generic domain, even with the lack of a relation based dataset.
- Although our approach learns meaningful relationships between object classes and utilizes hand designed algorithms to decide on occlusions, how humans perceive it can be different.
- As future work, we hope to develop a dataset that captures human annotations on object relations, which will enable end-to-end training of such networks.

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