Revisiting Deep Intrinsic Image Decompositions

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Codes and model: https://github.com/fqnchina/IntrinsicImage

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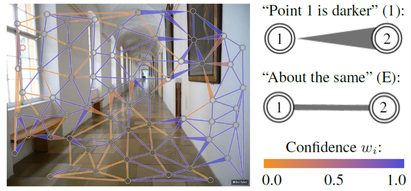
Problem Definition:

Input ≈ Albedo ⊙ Shading

Challenges:

- Densely labeled data (MIT and MPI-Sintel dataset)

- Pairwise comparison data (Intrinsic Images in the Wild)



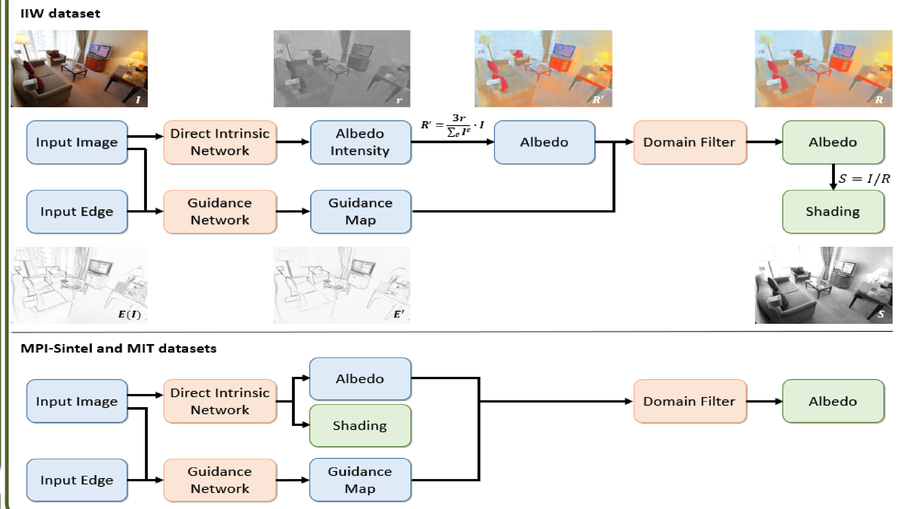
Proposed framework:

- Shared network structure:
  - Direct intrinsic image estimation (Direct Intrinsic Net)
  - Sparse guidance map prediction (Guidance Network)
  - Reflectance image flattening module (Domain Filter)
- Flexibly supervised loss layers
  - MSE for densely labeled data
  - Hinge loss for pairwise comparison data

Contribution:

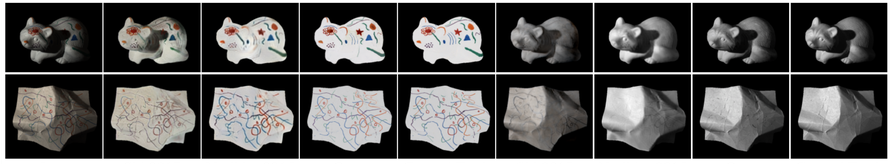
- The first deep architecture that is capable of achieving state-of-the-art results when applied on each major benchmark (IIW, MPI-Sintel and MIT datasets).
- Substantial improvement via joint training multiple datasets.

Illustration of the proposed framework

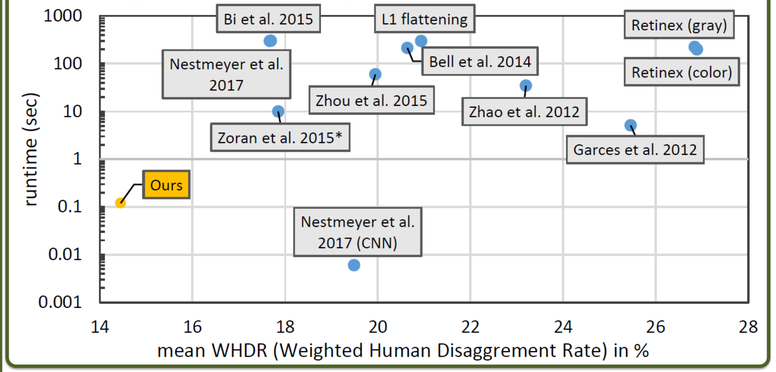


Visual results on the unseen data source

Visual results on the MIT dataset



Error against runtime plot for IIW dataset



Joint training over IIW and MPI-Sintel datasets.

(a), (b) are from unseen outdoor data, (c) is from IIW dataset.