Machine learning for computational photography

Over the last decade, the remarkable growth in computational power and the research progress on machine learning allowed to achieve impressive results across all areas of image and video processing.
It is envisaged that machine learning techniques, enabling understanding of the scene and objects depicted in images and videos, can also be successfully applied in computational photography field, in order to improve the capturing quality and extend the range of functionalities supported by current consumer cameras and mobile phones.

Machine learning for computational photography is, therefore, the topic addressed by this Grand Challenge; contributions targeting subjective quality improvement, as well as enabling new photographic effects and innovative functionalities or applications are sought.
A non exhaustive list of topics of interest encompasses, for example:

- Adaptive de-noising algorithms applied to recognized objects;
- Adaptive de-blurring algorithms applied to recognized objects;
- Deep learning for aesthetic evaluation of images and videos;
- Automatic adaptation of photographic parameters to the environmental characteristics and the objects of the scene;
- Non-photorealistic effects applied to automatically identified objects/scenes, such as cartoonization, caricatures,…

Input data used for training and execution of the proposed methods can be RGB, RGB-D, or multi-view images and videos. Any capturing device can be used to test the performances of the proposed methods, such as mobile phone cameras, structured light scanners, time-of-flight cameras, stereo cameras, lightfield cameras.
Proponents are allowed to generate results according to a dataset of their choice. Report on complexity for training and run-time execution is requested.

The proposed methods will be evaluated on the basis of their originality, reported performances, and exhaustiveness of testing material and procedures.

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