Detection of damage on steel manufacturing

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Abstract:

The traditional method used for corrosion damage assessment is visual inspection which is time-consuming for vast areas, impossible for inaccessible areas and subjective for non-experts. A promising way to overcome the a forementioned drawbacks is to develop an artificial intelligence-based algorithm that can recognize corrosion damage in a series of photographic images. A numerical framework for screening of uniform corrosion on steel structures. A fully automated, fast and objective screening for corrosion. A database of digital images including rust stains, non-uniform illumination, etc. Image analysis based on the roughness and color analysis, and a performance metric. This algorithm quantifies and combines two visual aspects – roughness and color – in order to locate the corroded area in a given image. For the roughness analysis, the uniformity metric calculated from the gray-level co-occurrence matrix is considered. For the color analysis, the histogram of corrosion representative colors extracted from a data-set in HSV color space is used. The algorithm has been applied to a large dataset of photographs of corroded and non-corroded components and structures. Our findings show that the developed algorithm can efficiently locate corroded areas.

References:

1) Detection of corrosion on steel structures using automated image processing
   https://doi.org/10.1016/j.dibe.2020.100022

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