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Can semantic inpainting inspire hydrogeologist?

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Semantic inpainting is the task of inferring missing pixels in an image given surrounding pixels and high level image semantics. This task is very similar to an important problem in geology, that is to infer the full geological field given physical measurements at sparse spatial locations. Typically, this is done using spatial interpolation method or by reproducing patterns from a reference image. However, these algorithms fail to produce realistic patterns and do not exhibit the wide range of uncertainty inherent in the prediction of geology. The semantic inpainting framework, based on generative models (e.g. GANs or PixelCNN), has great potential to be applied to generate varied realizations of geological field which honor physical measurements while matching the expected geological patterns.