

# THREE-DIMENSIONAL POROUS MEDIA RECONSTRUCTION USING DEEP LEARNING

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Reconstruction of the three-dimensional structure from images (photographs) of two-dimensional thin rock sections is one of the most challenging tasks in digital rock technology. This is an ill-posed problem, since the amount of input data is less than the number of output data. However, given a database of real-life three-dimensional structures we can approximate the latent distribution using recently proposed techniques in deep learning. We propose a new method which is based on the combination of decoder and generative adversarial networks (GAN). GAN is an extremely powerful tool for unsupervised machine learning, which allows to approximate the underlying hidden distribution in the space of real three-dimensional porous media samples. We test our method on the publicly available datasets from Imperial College and also on our original experimental data.