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Machine learning denoising for nanotomography

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Hard X-ray nanotomography is a commonly used tool in many research areas such as material science, biology and medicine. However, the quality of the reconstructed tomogram is often obscured by noise, especially for in situ experiments when a high time resolution is required. Machine learning (ML) techniques offer a powerful alternative to conventional filtering methods. Here, we present a ML denoising approach without the need of a reference scan. This technique is applied to high-resolution nanotomography data. The ML approach proves to be a very powerful tool that outperforms conventional filters by eliminating noise without blurring relevant structural features, thus enabling efficient quantitative analysis and fast measurements well suited for in situ applications.

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