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Deep Learning Strategies for SAR Image Restoration

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SAR (Synthetic Aperture Radar) images are invaluable data for earth observation. They can be acquired at any time, regardless of the meteorological conditions, and provide information on the characteristics of the earth, its height and its possible movement thanks to the phase information of the backscattered electromagnetic field.Due to the coherent imaging of the SAR sensors, images present strong fluctuations due to the speckle phenomenon. This phenomenon is a major obstacle for the analysis and understanding of SAR images. After an introduction to SAR imaging and SAR data statistics, the objective of this talk is to present some deep learning strategies to restore SAR images, in particular plug-and-play techniques, supervised, semi-supervised, and self-supervised methods. We will show how introducing the model of speckle physics inside the deep learning framework allow to outperform the state of the art methods.

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