

RadioUNet: Fast Radio Map Estimation with Convolutional Neural Networks

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January 23, 2020

We present RadioUNet, a highly efficient and very accurate deep learning method for estimating radio-maps. In wireless communication, radio-maps quantify the loss of signal strength from a transmitter to all spatial locations in a 3D environment due to large scale effects. We consider a supervised learning setting, in which RadioUNet is trained to minimize the error between its inferred radio-maps and ground truth radio-maps generated using standard physical simulations. RadioUNet learns to estimate the ground truth very accurately and between two to four orders of magnitude faster than other methods. We will discuss how to train RadioUNet when the dataset is based on rough and only partially reliable physical simulations. Last, we will present approaches for dealing with sparse datasets. This is joint work with Çağkan Yapar, Gitta Kutyniok and Giuseppe Caire.