

Enhanced Deep Residual Shrinkage Network Based Channel Estimation in RIS Communication System

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Abstract—Reconfigurable intelligent surface (RIS) composed of a large number of passive components can significantly save hardware cost and energy. However, its channel estimation is challenging since RIS commonly operates as a passive reflecting device and cannot acquire the channel state information (CSI) independently. In this paper, a data-driven approach for achieving highly accurate channel estimation in RIS assisted multi-user system is proposed. First, the channel estimation problem is modeled as a residual noise cancellation problem, and then the channel matrix with noise is obtained by a scaled least square (SLS) channel estimation. Finally, an enhanced deep residual shrinkage network (EDRSN) is designed to reduce the noise and further improve the accuracy of channel estimation.

Keyword—channel estimation, reconfigurable intelligent surface, EDRSN, denoising block



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