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Learning to See: Applying Inverse Recurrent Inference Machines to See through Refractive Scattering

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The Event Horizon Telescope (EHT) has captured images resolving the horizon of Sagittarius A*(Sgr A*), unveiling a new window into understanding strong gravity and cosmology. Scattering from the turbulent plasma of the interstellar medium distort the appearance of Sgr A*, limiting the practical angular resolution of Sgr A. We utilized a recurrent neural network trained on samples ignorant to General Relativistic Magnetohydrodynamics (GRMHD), due to the non-birefringence of Sgr A*, we were able to leverage the use of multiple polarizations in the scattering mitigation scheme, demonstrating that it is possible to mitigate scattering well below the instrumental resolution of EHT, 24 μas.

Keyword-1

Super massive black holes

Keyword-2

Convolutional Neural Networks

Keyword-3

Galactic center

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