Adversarial Training and Robust Optimization
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Optimization problems in Computer Vision often combine a prior term and a data fidelity term. Recently, the classical data terms such as least squares or least medians have been replaced with adversarial costs: the fidelity is measured by training a classifier to distinguish the true data from the predicted data. In this work, we show that under reasonable conditions, these adversarial costs are formally equivalent to robust estimators which have been used in computer vision for decades (e.g. Geman and Mclure). As one application of the theory, we show how to use robust estimation to generate sharp images in Gaussian Mixture Models of full images.