Abstract:

Image denoising - removal of white additive Gaussian noise from an image - is one of the oldest and most studied problems in image processing. An extensive work over several decades has led to thousands of papers on this subject, and to many well-performing algorithms for this task. As expected, the era of deep learning has brought yet another revolution to this subfield, and took the lead in today's ability for noise suppression in images. All this progress has led some researchers to believe that "denoising is dead", in the sense that all that can be achieved is already done.

Exciting as all this story might be, this talk IS NOT ABOUT IT!

Our story focuses on recently discovered abilities and vulnerabilities of image denoisers. In a nutshell, we expose the possibility of using image denoisers for serving other problems, such as regularizing general inverse problems and serving as the engine for image synthesis. We also unveil the (strange?) idea that denoising (and other inverse problems) might not have a unique solution, as common algorithms would have you believe. Instead, we will describe constructive ways to produce randomized and diverse high perceptual quality results for inverse problems.