

## **Flow Matching Meets Denoising**

Segolene Martin

In this talk, we explore the connections between flow matching and denoising, and show how these links can be leveraged to solve imaging inverse problems such as super-resolution and inpainting. We begin with a brief introduction to flow matching generative models, and recall the classical formulation of inverse problems, along with standard non-generative approaches, with a focus on the Plug-and-Play (PnP) framework. We then focus on how to train effective generative denoisers and provides practical guidelines. In particular, we investigate the impact of time weighting in the loss, as well as the parameterization of the neural network (e.g., predicting velocity, noise, or the denoised signal). Although these formulations are theoretically equivalent under perfect training, we show that they lead to markedly different empirical performance. In particular we highlight the importance of the architecture.