GPnP Basic Algorithm with Regularization

$\beta = {}^{1}/_{4}; \sigma = \sigma_{\max}; \alpha = 1.3;$

Randomly Initialize X

Repeat {

$X \leftarrow (1-\beta)X + \beta \text{Denoise}(X; \alpha\sigma) + \sqrt{\beta}\sigma \text{RandN}(0, \text{I})$

$X \leftarrow \bar{F}_1(X) + \sqrt{\beta}\sigma \text{RandN}(0, \text{I})$

$\sigma \leftarrow \text{Reduce}(\sigma)$

}

Return(x)

$\bar{F}_1(X)$ is the Forward Model Proximal Map

- Denoise$(X; \sigma)$ - MMSE denoiser trained for AWGN with variance σ^2.
- Increasing α increases regularization
- Prior is blurred by $(1+\beta)\sigma^2$, but with time $\sigma \to 0$