Checkpoint 1

Focusing on the specific trade-off from the Yeh 2019 paper and digging deep into the optimization implications : anything analytic, gradients, etc. feels like a well-scoped exploration that is likely to yield insights vs. trying for too many metrics. You will also need to formalize the SENS as you note carefully: chat with Hiwot; I think starting in the transductive case is fine but the inductive case is harder...

Checkpoint 2

This is great progress! How are you handling the integrals in your equation? I'd be particularly curious to know more about the quality of the optimization w.r.t. reaching fixed points as well as how the results change if you include a wider collection of points N but still a fixed kernel radius (so you can end up in situations where there are points far from the point of interest but near points near it).

Checkpoint 3

Good progress, for the final, will expect full derivations, and experiments + discussion that help us understand why your approach optimizes well and when/implications.