

Asymptotic Convergence of Non-convex Wasserstein Gradient Flow

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ABSTRACT

Over the past two decades, gradient flows in the optimal transport framework have received significant attention due to their wide-ranging applications. However, a general theory for non-convex energy functionals remains largely open. In my poster, I will discuss the theory of asymptotic convergence of Wasserstein gradient flows

$$\partial_t \mu_t = \operatorname{div} (\nabla \mu_t + \mu_t \nabla [V + W * \mu_t]) \quad (1)$$

for non-convex functionals associated with V, W on $\mathcal{P}_2(M)$, by applying Łojasiewicz-Simon theory in its tangent space. As a fundamental application, I will present the asymptotic behaviour of parabolic–elliptic Keller–Segel system

$$\begin{cases} \partial_t \rho = \nabla \cdot (\nabla \rho - \chi \rho \nabla c) + \nabla \cdot (\rho \nabla V), \\ (-\Delta + \alpha) c = \rho - \bar{\rho}, \quad \alpha \geq 0. \end{cases} \quad (2)$$

This is work in progress joint with Beomjun Choi (KAIST) and Geuntaek Seo (POSTECH).