

OIST Analysis on Metric Spaces Seminar

CURVE SHRINKING FLOW IN CARNOT GROUPS

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This is a preliminary report on a joint project with Enrico Le Donne (University of Fribourg, Switzerland). Motivated by the study of geodesics in sub-Riemannian geometry, we use techniques from Lie group geometry and Calculus of Variations to derive a system of PDE that describes the gradient flow of the length functional for horizontal (i.e. tangent to the first layer of the Lie algebra stratification) curves in a rank-two Carnot group of arbitrary step. Similarly to the Euclidean area-preserving curve shrinking flow, our PDE has a nonlocal term, which arises in view of the non-holonomic constraint, i.e. for each time the curve must be horizontal. We prove short time existence for the flow, if the initial data is a non-abnormal horizontal curve, and provide some indications of what happens in the abnormal case.