A Brief Introduction to Singularities of the Mean Curvature Flow

Josh Daniels-Holgate

Abstract

The Mean Curvature Flow is a parabolic, quasi-linear system of PDEs describing the evolution of a submanifold by its mean curvature. For curves in the plane it is also known as the Curve Shortening Flow.

Short time existence and uniqueness of smooth solutions from a given hypersurface is known. Moreover, the smooth flow can be continued for as long as the curvature remains bounded. Tools such as the Avoidance Principle tell us that singularities must form.

Understanding the flow at and through these singularities is an area of ongoing research. I will detail how we can approach understanding these singularities, in particular, I will explain the Level Set Flow, a weak solution to the Mean Curvature Flow.

Time: 3 p.m. – 4 p.m., 9th December 2020
Location: W.O.M.P.S. (M.S. Teams)

Organiser: Simon Gabriel (simon.gabriel@warwick.ac.uk), Arjun Sobnack (arjun.sobnack@warwick.ac.uk)
Website: https://warwick.ac.uk/fac/sci/maths/research/events/seminars/areas/postgraduate/20-21