

The CDT in PDEs is pleased to announce the following mini-course in Trinity term 2020:



An introduction to necessary conditions in Optimal Control Theory

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2-4pm on 5th [C1], 6th, 7th, 8th & 11th May, [L5]

Abstract

This course is conceived for graduate students in Mathematics, Engineering, Informatics, Physics, Economics, and other disciplines where Maths plays an important role. It focuses on the celebrated Pontryagin Maximum Principle, which consists in some general necessary conditions for minima of Optimal Control problems. The latter generalize Calculus of Variations' problems, in that the velocities are dynamically constrained by ordinary differential equations with *control* parameters (which, in applications, model human or automatic intervention in the laws regulating the process at issue).

The main proof we will present relies on a strong, intuitive, geometric idea, namely *set-separation*, which in turn is made precise by a suitable application of general tools such as cones' transversality and a directional open mapping theorem.

Time permitting, some issues from Geometric Control theory will be mentioned (e.g. Lie brackets), as well as connections with Hamilton-Jacobi PDE's.

During the days of the course I will be fully available for all those who wish to look into some subjects in greater depth. Furthermore, detailed lecture notes will be available at the start of the course.

All graduate students, post-docs, faculty and visitors are welcome to come to the lectures. If you aren't a member of the CDT please email pde-cdt@maths.ox.ac.uk to confirm that you will be attending.