CA18232: VARIATIONAL METHODS AND EQUATIONS ON GRAPHS
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Mathematical modeling of traffic flow

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Traditionally, there are two types of mathematical models for vehicular traffic, namely the Follow-the-Leader (FtL) models and the continuum models, using variants of the classical Lighthill–Whitham–Richards (LWR) models. In the FtL models individual vehicles are tracked, and this leads to a system of ordinary differential equations. On the other hands, in LWR models, traffic is represented by the density of vehicles, and the resulting equation is a first order hyperbolic conservation law. We will study the continuum limit of the FtL model when traffic becomes dense. We will also mention the problem of modeling traffic flow on networks.

In the second part of the talk, we will discuss a novel model for multi-lane traffic within the LWR framework. The talk is based on joint work with Nils Henrik Risebro (University of Oslo).