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Calibrating mobile sensor traffic data on spatial networks

Estimating traffic volumes across street networks is a critical step toward enhancing transport planning and implementing effective road safety measures.

Traditional methods for obtaining traffic data rely on manual counts or high-precision automatic sensors (e.g., cameras or inductive loops). While manual counting is labor-intensive and time-consuming, fixed sensors are costly and typically limited in spatial coverage.

Recently, the widespread use of mobile sensors—such as smartphones and GPS navigation devices—has led to a growing number of approaches for inferring traffic volumes from geo-referenced mobility data.

In this paper, we propose a spatial statistical calibration method based on geographically weighted regression (GWR), which integrates precise fixed sensor counts with extensive mobile GPS data to estimate traffic flows. The methodology is adapted to the spatial network setting and demonstrated using data from the city of Leeds (UK).

Special/ Invited session

Classification

Mainly application

Keywords

spatial regression, spatial network

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Track Classification: Statistical/Stochastic Modelling