

# The role of spatial knowledge in the on-line control of high-speed steering

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## Abstract

There is a long line of research that has investigated how different kinds of visual information (e.g. optic flow) guide high-speed steering. Additionally, researchers have developed visual control models that capture the relationship between information and steering. Although models have been designed for a variety of steering maneuvers, they all assume that steering behavior remains consistent whether a driver has driven down a road once or numerous times. Thus, models do not address how behavior changes as drivers become familiar with the layout of the road. Our work investigates how drivers incorporate visual information and spatial knowledge to guide steering. We present a virtual driving experiment that examines how steering changes as humans become more familiar with a track, measuring metrics including speed, steering angle, and lane deviation. Results inform the development of a cognitive model that captures the relationship between visual information and spatial knowledge to guide steering behavior.