TU Clausthal

Abschlussvortrag Masterarbeit Sheshu Marshetty

„Cyclist Simulation and Models of Bicycle Traffic: A Systematic Literature Review“

The rising popularity of cycling as a sustainable method of transportation and recreational activity needs a better knowledge of cyclist behavior, bicycle dynamics, and traffic interactions in order to improve safety, efficiency, and user experience. This thesis provides a systematic literature review of cycling simulation and bicycle traffic models, using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology. To provide a full and transparent analysis, this review includes a wide range of simulation techniques, from traditional microscopic and macroscopic models to modern virtual reality applications, offering a comprehensive picture of the current state of research while also revealing key gaps and possibilities for future research. After a thorough review of the literature, we have divided simulation technologies into three primary categories: Simulation tools for cyclists, Virtual Reality Simulation, and Cyclist Motion Data. Each of these categories offers a distinct perspective on how cyclists behave and interact in urban environments. The study emphasizes how simulation technologies are always developing and how important it is to comprehend and enhance bicycle dynamics, cyclist safety, and urban infrastructure design. The results of our study reveal that there is a significant focus on enhancing the realism and accuracy of simulation models to better reflect real-world cycling situations, such as cycling motion dynamics, cyclist decision-making processes, and interactions with automobiles and urban infrastructure. However, the review also emphasizes the necessity for additional validation of these simulation models against empirical data to verify their reliability and effectiveness in urban planning and safety assessments. In addition to identifying important areas for future research. Our goal is to promote the development of urban transportation systems that are safer, more effective, and more accommodating to cyclists by addressing the research gaps.

Betreuer der Arbeit:	Prof. Dr. Jörg P. Müller (Institut für Informatik), PD Dr. Christoph Knieke
Datum:	Dienstag, 02. Juli 2024, 11:00 Uhr
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