

Title: A method for extracting data for quantification of comfort zone boundaries for intersection negotiation from in-vehicle naturalistic data

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Drivers' allocation of attention and their driving behavior is partly driven by their expectations for how events will unfold in the near future (Engström, 2011; Weir & McRuer, 1973). Comfort zone boundaries based on drivers' expectations lead drivers to adapt their behavior to avoid collisions with other road users (Gibson & Crooks, 1938; Ljung Aust & Engström, 2011; Summala, 2007). These boundaries can be empirically defined using a multi-dimensional state space. Dimensions include, but are not limited to, distance and time to other road users and the driver's allocation of attention. Context-specific quantitative descriptions of drivers' comfort zone boundaries for a variety of contexts provides a basis for understanding attention allocation and driving behavior. In this presentation we discuss initial efforts to enable description of comfort zone boundaries for a set of intersection contexts. This study uses three different types of data to address a variety of intersection contexts. The dataset includes 1) naturalistic driving data from the euroFOT project (Benmimoun et al., 2011), 2) on-road experiments with high-fidelity eye-tracking, environment sensing, and gaze allocation data, and 3) test track data. We describe the methodology used to extract information from in-vehicle naturalistic data for location based analysis in intersections and a set of results used to quantify comfort zone boundaries. The method and results are first steps towards an empirical methodology that develops quantitative descriptions of comfort zone boundaries that can inform the design of Advanced Driver Assistance System.

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Engström, J. (2011). *Understanding attention selection in driving: From limited capacity to adaptive behaviour*. Doctor, Chalmers University of Technology, Göteborg.

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Ljung Aust, M., & Engström, J. (2011). A conceptual framework for requirement specification and evaluation of active safety functions. *Theoretical Issues in Ergonomics Science*, 12(1), 1-22.

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