

ADDRESSING THE CHALLENGES FOR HIGH PERFORMANCE COLLABORATIVE POSITIONING IN VEHICULAR AD-HOC NETWORKS

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ABSTRACT:

Cooperative or collaborative positioning (CP) algorithms have gained prominence from their successful application to localising individual nodes within wireless sensor networks. Their potential is now being exploited for other applications in which mobile, ad hoc networks are a common feature of the application architecture. Whilst the theory underpinning CP algorithms is strongly supported in the literature, their practical realisation has proven challenging. In this paper, we focus on the practical use of CP algorithms across vehicular ad hoc networks (VANETS). VANETS are of special interest given their significant role in realising the full benefits of intelligent transport systems (ITS). In addition, the allocation of spectrum in the 5.9 GHz band – dedicated short-range communications (DSRC) – specifically for automotive use, facilitates the establishment of VANETS similar to those encountered in the domain of WSN. DSRC, enables the sharing of information between vehicles, which offers the promise of improved reliability and availability of positioning for all vehicles within the VANET. Given the increasing stringent requirements of positioning quality for ITS application, this paper explores the potential of CP algorithms to meet the high performance positioning requirements for ITS. This paper firstly introduces the typical requirements for positioning for ITS application. It describes the concept of CP and presents the challenges for their use in generating the optimal positioning solution for VANETS. Examples of CP algorithms developed for use in vehicular positioning and preliminary results that describe the potential performance capabilities of these algorithms are also presented.

1. MANUSCRIPT

1.1 General Instructions

The maximum paper length is restricted to 8 pages. Invited papers can be increased to 12 pages. The paper should have the following structure:

1. Title of the paper
2. Authors and affiliation
3. Keywords (6-8 words)
4. Abstract (100 - 250 words)
5. Introduction
6. Main body
7. Conclusions
8. Acknowledgements (if applicable)
9. References
10. Appendix (if applicable)

1.2 Page Layout, Spacing and Margins

The paper must be compiled in one column for the Title and Abstract and in two columns for all subsequent text. All text should be single-spaced, unless otherwise stated. Left and right justified typing is preferred.

*Corresponding author. This is useful to know for communication with the appropriate person in cases with more than one author

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Setting	A4 size paper	
	mm	inches
Top	25	1.0
Bottom	25	1.0
Left	20	0.8
Right	20	0.8
Column Width	82	3.2
Column Spacing	6	0.25

Table 1: Margin settings for A4 size paper

2. TITLE AND ABSTRACT BLOCK

2.1 Title

The title should appear centered in bold capital letters, at the top of the first page of the paper with a size of twelve (12) points and