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An Algebraic Solution to the Multilateration Problem

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ABSTRACT

Across the spectrum of known algorithm for position estimation there is no favorite methode. Some algorithms require intensiv computation capabilities, while other algorithms could be implemented in devices e.g. sensor nodes with limited ressources. In this paper an approach for solving nonlinear problems on the example of multilateration is presented in both cases with and without overdetermination. Thereby neither approximation, nor iterative solutions are used. In the proposed method, the nonlinear elements of the equations system are treated as additional unknowns, which represent simultaneously a constraint. Thus a new equations system is created, which is solved by mean of linear algebra methods with low computational complexity. The algorithm was implemented and tested in conjunction with a developed UWB indoor positioning system

KEYWORDS: Localization, Trilateration, Multilateration, Ultra Wide Band, Sensor networks.