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Haim Simkovits, Anthony J. Weiss, Alon Amar

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ACCEPTED MANUSCRIPT

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Haim Simkovits*, Anthony J. Weiss

School of Electrical Engineering, Tel Aviv University, Tel Aviv 69978, Israel.

Alon Amar

Faculty of Electrical Engineering, Technion, Haifa, Israel.

Abstract

Inertial navigation systems are known to yield rather accurate measurements over short time intervals, while their error variance tends to increase with time. In order to keep the error within specification most systems use GPS signals. In the absence of GPS data, due to jamming or spoofing, it is desirable to use **signals of opportunity** instead. We examine the use of time of arrival measurements of **signals of opportunity** that have known structure. We propose **a low complexity** semi-definite relaxation algorithm by converting the maximum likelihood location estimator to a convex optimization problem. Simulation results demonstrate that the proposed algorithms converge to the Cramér-Rao lower bound under some geometrical and noise limitations.

Keywords: Inertial navigation system, time of arrival, maximum likelihood estimator, signals of opportunity, semi-definite programming.

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*Corresponding author

URL: haimsimkovits@gmail.com (Haim Simkovits), ajw@eng.tau.ac.il (Anthony J. Weiss), aamar@techunix.technion.ac.il (Alon Amar)

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