

## TRACC: Algorithm for Predicting and Tracking Barges on Inland Waterways

### Copyright Document Number

50000013

### Copyright Summary

The algorithm is used to predict the location and estimate the traveling speed of a barge moving in inland waterway network. Measurements obtained from GPS or other systems are corrupted with measurement noise and reported at large, irregular time intervals. This creates uncertainty about the current location of the barge and minimizing the effectiveness of emergency response activities in case of an accident or act of terrorism. Developing a prediction algorithm was a challenge due to estimation of speed, attributed to the complex interactions between multiple systems associated in the process. This software, uses systems approach in modeling the motion dynamics of the barge and estimates the location and speed of the barge at next, user defined, time interval. In this technology development, to estimate the speed, a non-linear, stochastic modeling technique was developed that utilize local variations and interactions existing in the system. Output speed is then used as an observation in a statistically optimal filtering technique, Kalman filter, formulated in state-space to minimize numerous errors observed in the system. The combined system synergistically fuses the local information available with measurements obtained to predict the location and speed of traveling of the barge accurately.

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### Licensing Contact

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