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**Ryan T. White\*** ([rwhite2009@fit.edu](mailto:rwhite2009@fit.edu)), Department of Mathematical Sciences, Florida Institute of Technology, 150 W. University Blvd., Melbourne, FL 32901. *Time Sensitive Analysis of  $d$ -dim Independent and Stationary Increment Processes.*

We study the behavior of the random walk of a particle on a  $d$ -dimensional random grid enclosed by an open rectangle. Since the grid is randomly generated as the particle moves, determining the first crossing time and the position of the particle upon escape is nontrivial. We model this by a  $d$ -dimensional independent and stationary increment jump process  $A(t)$ . The problem is further embellished by observing  $A(t)$  only upon a point process  $\{\tau_n\}$ , so that the behavior of  $A(t)$  around the threshold is unavailable. The focus of the work is to probabilistically “interpolate” from pre- and post-crossing observation times to revive probabilistic data on the process upon its real-time crossing. We obtain key information about  $A(t)$  within a random vicinity of the real-time crossing as a characteristic function jointly with the observation times immediately before and after the crossing and the position of the process upon these times. The process has two primary applications: (1) modeling networks under attacks disabling valuable nodes, where the results can predict their crashes and offer remedies, and (2) modeling the short-term accumulation of funds, which is useful in tracking suspicious financial transactions. (Received July 31, 2017)