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(54) **SYSTEM AND APPARATUS FOR THE
DETECTION OF RANDOMNESS IN TIME
SERIES DISTRIBUTIONS MADE UP OF
SPARSE DATA SETS**

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(57) **ABSTRACT**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

A method and apparatus are provided for automatically characterizing the spatial arrangement among the data points of a time series distribution in a data processing system wherein the classification of said time series distribution is required. The method and apparatus utilize a grid in Cartesian coordinates to determine (1) the number of cells in the grid containing at least one input data point of the time series distribution; (2) the expected number of cells which would contain at least one data point in a random distribution in said grid; and (3) an upper and lower probability of false alarm above and below said expected value utilizing a discrete binomial probability relationship in order to analyze the randomness characteristic of the input time series distribution. A labeling device also is provided to label the time series distribution as either random or nonrandom, and/or random or nonrandom.

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(51) **Int. Cl.**⁷ **G06F 7/00; G06K 9/00**

(52) **U.S. Cl.** **708/200; 382/228**

(58) **Field of Search** **708/200, 520; 382/228, 181, 209, 210, 224, 225; 706/20**

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11 Claims, 5 Drawing Sheets

