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B. Kedem, E. Slud

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BINARY TIME SERIES

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FINAL REPORT ON CONTRACT F49620-79-C-0095

(B. Kedem and E. Slud, Mathematics Department,
University of Maryland, College Park, MD 20742)

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The research titled "Binary Time Series" under this contract has dealt with higher order crossings, quantities which were defined and proved to be useful in discrimination in time series. In particular the Higher Order Crossings Theorem has been proved and a new goodness of fit and discrimination statistic has been suggested and applied in testing model adequacy in ARIMA processes, and in discrimination in EEG data.

A connection with an application to particles arrangements in physics has been found and a quantity called an m'th order unit has been defined. This has been applied in finding the distribution of rare events in Binary Series.

This work resulted in three reports:

1. Higher Order Crossings in the Discrimination of Time Series I, TR 79-66, Mathematics Department, University of Maryland. (Kedem and Slud)
2. Higher Order Crossings in the Discrimination of Time Series II, TR 79-81, Mathematics Department, University of Maryland. (Kedem and Slud)
3. On Nearest Neighbor Degeneracies of Indistinguishable Particles, TR 80-35, Mathematics Department, University of Maryland. (Kedem)

Three papers were sent for publication:

1. The Signature Problem for Stationary Time Series. (Kedem and Slud)
2. On Goodness of Fit of Time Series Models: An Application of Higher Order Crossings. (Kedem)
3. On Nearest Neighbor Degeneracies in Indistinguishable Particles. (Kedem)

No patent has been established. The above three reports have been sent to the Air Force Office of Scientific Research. The first paper is a summary of reports 1, 2. The second paper was sent to AFOSR together with the renewal application. The third paper is also the third report.

Grant AFOSR 80-0211 is the continuation of Contract F49620-79-C-0095.

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