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# Pattern Recognition Method for Size Series of Cocoon Filament

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**Abstract**

In order to categorize size series of cocoon filament (SSCF), which are non-stationary time series with finite length in terms of mean and auto-covariance, by means of the time varying parameter auto-regressive (TVPAR) model theory, statistical methods of learning and recognition were used to extract the characteristics of size series of cocoon filament. Through learning the size series, using closed data, the rates of correct recognizing which of two cocoon categories a given size series of cocoon filaments belongs to were 96.95% and 98.72% for a single series and the mean of two series, respectively. The rate of correct recognition was higher after suitable filtering. The theory and method can be used to analyze other types of non-stationary time series with finite length.

**Keywords**

time series analysis, nonstationarity, pattern recognition, size series of cocoon filament

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