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## RECENT ADVANCES IN TIME SERIES MODELLING AND FORECASTING

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ORGANIZER: PAULO CANAS RODRIGUES, FEDERAL UNIVERSITY OF BAHIA, BRAZIL

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### TALK 1: PREDICTION INTERVALS IN SINGULAR SPECTRUM ANALYSIS

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SPEAKER: PAULO CANAS RODRIGUES, FEDERAL UNIVERSITY OF BAHIA, BRAZIL

In recent years Singular Spectrum Analysis (SSA) has been used as a powerful technique to analyze time series, including theoretical developments and application to many practical problems. However, no inclusive theoretical approach has been discussed regarding the construction of confidence intervals, up to now.

Due to the prominent role of prediction intervals in evaluating the accuracy of forecasts in time series analysis, in this paper, we consider the topic of constructing prediction intervals for SSA. Namely, we revise the existing approaches for the recurrent SSA forecasting method and propose a new alternative based on the Chebyshev's inequality. Moreover, we also present two types of prediction intervals for the vector SSA forecasting method: one based on the empirical quantiles of the residuals and the other on the Chebyshev's inequality. The results from the existing and proposed approaches are compared by applying them to real and simulated data.

This is a joint work with Rahim Mahmoudvand, Fatemeh Alehosseini and Kristina Lurz.

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### TALK 2: SOME THEORETICAL ASPECTS OF THE MULTIVARIATE SINGULAR SPECTRUM ANALYSIS

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SPEAKER: RAHIM MAHMOUDVAND, BU-ALI SINA UNIVERSITY, IRAN

Singular Spectrum Analysis is now a well known, almost classical method, which has found much application for time series analysis. In this paper, we consider multivariate singular spectrum analysis (MSSA) from the theoretical point of view. We assess the behavior of the trajectory matrix, which is the result of the first step of MSSA and further steps depends on its structure and characteristics, with respect to different values of the MSSA parameters. Several forms of this matrix will be considered and their performances for the analysis and forecasting time series data are evaluated. Additionally, the optimality of the MSSA parameters are considered and various bounds are introduced.