Pls avoid scheduling conflict

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Measurement and Modelling of a Heaving Airfoil Flow VICTOR TROSHIN, AVRAHAM SEIFERT, Tel Aviv Univ — An outline of a low order modelling procedure of a heaving airfoil in still fluid using experimental measurements is provided. Due to its relative simplicity, the proposed procedure is applicable for the analysis of flow fields within complex and unsteady geometries and it is ideal for analysing the data obtained by experimentation. Currently, this procedure is used to model and predict the flow field evolution using small number of low profile load sensors and flow field measurements. The time delay neural networks are used in order to estimate the flow field. The neural networks estimate the amplitudes of the most energetic modes using four sensory inputs. The modes are calculated using proper orthogonal decomposition (POD) of the flow field data obtained experimentally by time-resolved, phase-locked particle imaging velocimetry. In order to permit the use of proper orthogonal decomposition, the measured flow field is mapped onto a stationary domain using volume preserving transformation. The analysis performed by the model showed good estimation quality within the parameter range used in the training procedure. However, the performance deteriorates for cases out of this range. This state indicates that, in order to improve the robustness of the model, both the decomposition and the training data sets must be diverse.

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