

# EMOSC 25: Energy-based modeling, simulation, and control of dynamical systems - Workshop in honor of Volker Mehrmann's 70th birthday



Contribution ID: 33

Type: **Talk**

## Data driven dynamics in trees

*Tuesday 27 May 2025 11:30 (30 minutes)*

This talk concerns the challenge of identifying states of dynamic systems that operate across multiple time scales, ranging from youth to old age, drawing on personal experiences of the speaker in collaboration with V. Mehrmann.

The central state identification challenge arises from the fact that data is only accessible at the finest time scales, and may be rapidly forgotten (e.g., breakfast to dinner), rendering longer trends nearly unobservable, and thus necessitating the introduction of coarser, hidden variables that are able to capture broader temporal dependencies. Our approach extends the usual framework of Kalman filtering to graphical models and has elements in common with methods for modeling multiresolution stochastic processes on dyadic trees, while avoiding some of the limitations of tree-structured models.

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**Session Classification:** Talks