distribution. Numerical simulations show a substantial improvement in the accuracy of the estimates over state-of-the-art kernel-based methods.

2. **Title:** Approximate regularization path for nuclear norm based H_2 model reduction
Authors: Niclas Blomberg, Cristian R. Rojas, Bo Wahlberg (KTH, Sweden)
Abstract: This contribution considers H_2 model reduction on a regularized optimization problem with a nuclear norm constraint. The problem gives a trade-off between model fit and model complexity. The main issue is the choice of regularization parameter. Since the choice of regularization parameter is difficult, the full regularization path is outlined, so that the regularization parameter can be chosen on basis of the outline. The trick is to solve the optimization problem for a sparse set of regularization parameter values. In between these points the solution is approximated. An upper bound on the approximation error is derived. Then the parameter values where I compute true solutions can be chosen so that the approximation error will be kept below some tolerance. The choice of this tolerance is also dealt with, as well as weighted versions of the optimization problem.

3. **Title:** From black-box LTI state-space models to gray-box state-space representations: some new developments
Authors: Guillaume Mercère (University of Poitiers, France) and Olivier Prot (Limoges University, France)
Abstract: Estimating the order as well as the matrices of a linear state-space model is now an easy problem to solve. However, it is well-known that the state-space matrices are unique modulo a non-singular similarity transformation matrix. This could have serious consequences if the system being identified is a real physical system. Indeed, if the true model contains physical parameters, then the identified system could no longer have the physical parameters in a form that can be extracted easily. The question addressed in this paper then is, how to recover the physical parameters once the system has been identified in a fully-parameterized form. Three techniques have been recently developed by the authors of this poster. These three algorithms are presented, then compared by focusing on their respective advantages and drawbacks along with an example of an electronic nose.

4. **Title:** The Local Rational Method for H_∞ norm estimation reduces measurement time
Authors: Egon Geerardyn (ELEC-VUB, Belgium), Tom Oomen (TU Eindhoven, The Netherlands) and Johan Schoukens (ELEC-VUB, Belgium)
Abstract: In the design of robust controllers, the plant model uncertainty plays a crucial role. Based on frequency response function measurements its H-infinity norm is easily underestimated since it may contain sharp resonance peaks which are sampled using a limited frequency resolution. This can result in overly optimistic controllers that fail to attain the required performance and/or stability requirements. In this poster we estimate the H_∞ norm using the Local Rational Method (LRM). By combining low-order local rational models one obtains a more detailed view of a frequency response function and its H_∞ norm. Using this strategy, the H_∞ norm estimate is improved in a short measurement time. This is illustrated on an industrial active vibration isolation system where a 7.5 dB increase can be observed and validated against a much larger data set.

5. **Title:** Periodic Linear Parameter-Varying identification: state space and input-output models in the frequency domain
Authors: Jan Goos and Rik Pintelon (ELEC-VUB, Belgium)
Abstract: We are studying a class of Linear Parameter-Varying (LPV) systems, where the system dynamics change according to some kind of external signals, called the scheduling parameters *p(t)*. We assume that these scheduling signals can be observed without errors. Let us focus on the LPV subclass where the parameter variation is periodic. The model equations then become very sparse and structured in the frequency domain, which can be exploited. The goal of this research is to identify an LPV model suited for control. We therefore opt for a state space form. In previous work, we proposed an LPV state space identification scheme, that was initialized with the Best Linear Time-Invariant (BLTI) approximation. We compare these previous results with a new initialization from an (identified) input-output model, that is realized exactly as a canonical state space form. This representation however, depends on (higher) order time derivatives of the coefficients of the differential equation. Therefore, in a second step, an optimization routine searches for an equivalent state space instance that has only a static dependency on *p(t)*. Such a model would be very suited for LPV control.

6. **Title:** Exploring the performance of the D-optimal input design for a linear second order system with respect to the frequency grid
Authors: Alexander De Cock and Johan Schoukens (ELEC-VUB, Belgium)
Abstract: The goal of D-optimal input design is to find the input sequence for which the uncertainty volume in the parameter space is minimal. This corresponds to a maximization of the determinant of the Fisher information matrix if the estimator is efficient and unbiased. For linear systems, it has been shown that this optimization problem is convex with respect to the power spectrum of the input. In order to make the problem tractable, the frequency band of interest is discretized into a uniformly spaced frequency grid. However, it is often neglected that working on a discrete grid can lead to performance degradation compared to the optimal design computed on the continuous frequency band. Our goal is to study this performance degradation for second order systems. Once the behavior of the performance degradation has been characterized for a second order system, the result will be generalized to higher order systems. This can be done by representing the higher order systems as a combination of second order systems.

7. **Title:** A preliminary look at the self-study kit for dissemination of nonlinear system identification
Authors: Mark Vaes, Johan Schoukens and Yves Rolain (ELEC-VUB, Belgium)
Abstract: Practitioners in industry often face nonlinear systems but nevertheless use Linear Time Invariant (LTI) identification due to restricted dissemination of nonlinear identification knowledge. Being aware that most systems can behave nonlinearly, there is a need for a more widespread knowledge about the nonlinear system identification (SI) in general and the NL detection in particular. The goal of this work is to create a self-study kit to introduce this knowledge to the practitioner in a practical and self-contained way. The focus is put to obtaining useful, intuitive, and usable hands-on knowledge of nonlinear SI. To this end, every step is applied to a small practical but real test case system in order to keep the gap between theory and practice very small. A small mechanical test case system is already built to support the self-study kit. The self-study kit will support more than a linear learning process to allow users, with different background knowledge, learn nonlinear SI. It will be created in a cross-linked