

Challenging Ourselves: Three Benchmarks for Nonlinear System Identification

Maarten Schoukens (VUB, Belgium), Jean-Philippe Noël (ULg, Belgium)

This talk presents three new benchmarks for nonlinear system identification: a Bouc-Wen hysteretic system, a Wiener-Hammerstein system with process noise, and a cascaded tank system. They are believed to feature state-of-the-art challenges in the field, namely dynamic nonlinearities, process noise in nonlinear systems and short data records respectively.

The prime goal of these three benchmarks is to advance the current knowledge in nonlinear system identification by fostering informal exchange of ideas and formal collaborations between the system identification, the mechanical and the machine learning communities. These three communities have developed over the years various and numerous nonlinear modeling approaches driven by specific backgrounds, constraints and end-uses. Moreover, they generally face different challenges and thus focus on different aspects of the modeling problem. This is why we believe that, by promoting interaction, significant benefit can be mutually gained.

To achieve this goal, we organize a three-day research workshop in spring 2016 at the Vrije Universiteit Brussel, Brussels, Belgium. This workshop will be structured around the three proposed benchmark systems and will consist of keynote lectures, plenary presentations, and free discussion sessions.

The participants will be able to apply their self-designed signals to the Bouc-Wen hysteretic system and the Wiener-Hammerstein system, the cascaded tank system comes with a fixed data record. The data records used for the different modeling approaches will be made available on an online repository such that they remain accessible in the future to test newly developed modeling approaches.

More info on: <http://homepages.vub.ac.be/~mschouke/benchmark2016.html>