**Introduction**

- Most parametric identification techniques require an expert user to make critical decisions and/or assumptions. These include:
  - (Non)linearity
  - Parametric model structures
  - Model order
  - Noise properties
  - Uniformity of sampling
- These decisions require an expert user’s knowledge, and are in general, tedious.
- This research seeks to eliminate the need for such user choices, with the aim of automating system identification for (possibly nonlinear) dynamical systems.

**Symbolic Regression**

- Symbolic regression refers to the problem of fitting mathematical models to measured data.
- This is done using evolutionary optimization techniques such as genetic programming.
- Mathematical models are viewed as expressions built from several modular blocks.
- The process is illustrated in Figure 2.

**Test Applications**

- Possible test setups for the validation of the proposed identification scheme include:
  - 3 degree of freedom gyroscope
  - A hybrid clutch from FMTC
  - General modelling test setups at ASML
  - Robotic test applications from National Instruments.

**Proposed Scheme**

- The proposed scheme incorporates symbolic regression into a system identification framework for (possibly nonlinear) dynamical system. The scheme is illustrated in Figure 3.

**References**