VIMAL JYOTHI ENGINEERING COLLEGE, CHEMPERI. KANNUR

METRON...

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Need of system identification...

Inside this issue:

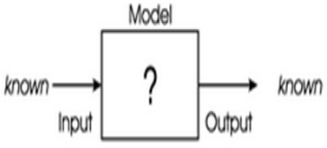
System identification is a method of identifying or measuring the mathematical model of a system from measurements of the system inputs and outputs. The applications of system identification include any system where the inputs and outputs can be measured and include industrial processes, control systems, etc. It uses statistical methods to build mathematical models of dynamical systems from measured data. System identification also includes the optimal design of experiments for efficiently generating informative data for fitting such models as well as model reduction.

A dynamical mathematical model in this context is a mathematical description of the dynamic behavior of a system or process in either the time or frequency domain.

One could build a so-called white-box model based on first principles, e.g. a model for a physical process from the Newton equations, but in many cases such models will be overly complex and possibly even impossible to obtain in reasonable time due to the complex nature of many systems and processes.

A much more common approach is therefore to start from measurements of the behavior of the system and the external influences (inputs to the system) and try to determine a mathematical relation between them without going into the details of what is actually happening inside the system. This approach is called system identification. Two types of models are common in the field of system identification: Grey box model, Black box model

Parameter estimation is relatively easy if the model form is known but this is rarely the case. Alternatively the structure or model terms for both linear and highly complex nonlinear models can be identified using NARMAX methods. This approach is completely flexible and can be used with grey box models where the algorithms are primed with the known terms, or with completely black box models where the model terms are selected as part of the identification procedure. Another advantage of this approach is that the algorithms will just select linear terms if the system under study is linear, and nonlinear terms if the system is nonlinear, which allows a great deal of flexibility in the identification.



Steady state analysis and control of PEM fuel cell power plant

Kavya V R .Assistant Professor E&I Dept

***Abstract*—The paper presents the details of steady state analysis and control of proton exchange membrane fuel cell power plant. The system consists of a proton exchange membrane fuel cell stack and ancillary devices like valves, coolant pumps, gas heaters and blowers which constitute the balance of plant. Balance of plant is responsible for keeping the electrode stack under proper conditions and enabling load delivery as per the demand. From control point of view, the key components involve water heater, humidifiers and gas pre heaters. A control strategy for these system using PID controllers is presented here, with the help of Simulink. The significance of heating section in the overall performance is also analysed.**

Keywords—PEM fuel cells, PID Controllers

The world energy demand is growing at a rate of 1.8% per year. Short and long term goals to be addressed are greater energy efficiency and better integration of renewable energy sources. On this path, characterized by technical developments, as an efficient and clean technology, fuel cells can make a substantial contribution .

To suggest a better control strategy for the heating and humidifying sections of Proton Exchange Membrane fuel cells, cascade control and feed-forward feedback control were simulated in simulink and the results were compared.

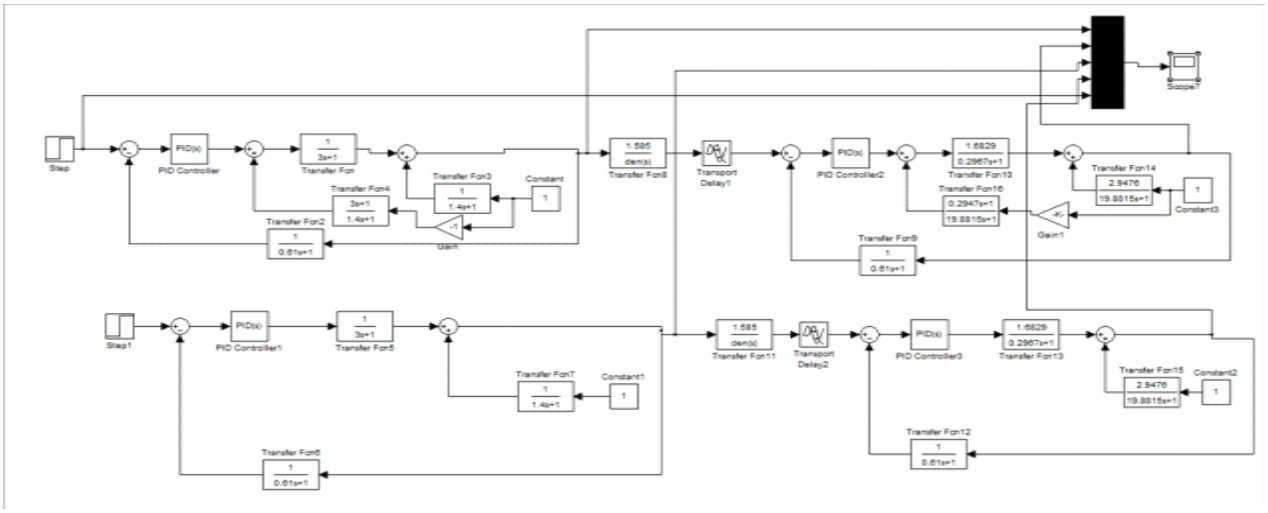


Fig1 : Simulink implementation of control of heating and humidifying section with and without feed-forward control

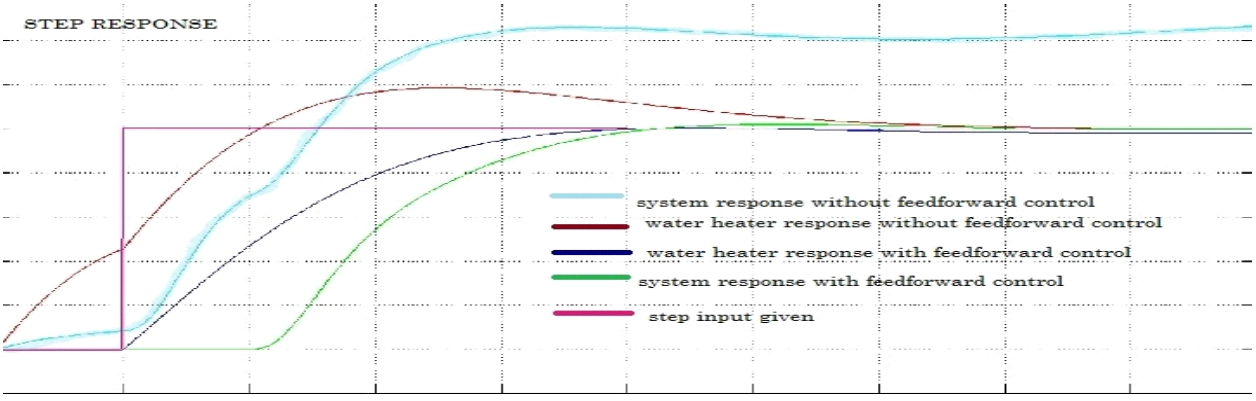


Fig 2. Step response of heating and humidifying sections of PEM fuel cell with and without feed-forward control

SMEC Labs Workshop on PLC & SCADA For S4 E&I

3 days Workshop on PLC & SCADA was conducted by SMEC LABS, Cochin for S4 students of Electronics & Instrumentation Department from 29th November to 1st December 2013. The workshop was of much importance & the feedback of the students were good. The trainers were Mr. Suhail & Mr. Prabhuraj who had years of experience in the automation field.

FACULTY DEVELOPMENT PROGRAMME

Faculties from E&I Department Mr. Dhanoj M, Mr. Akhil V Jose, Mr. Dileep K attended FDP on Advanced Control Theory and Application from 8th to 14th December 2014, Sponsored by Tequip and MHRD

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ELECTRONICS AND INSTRUMENTATION

Departmental advisory committee meeting

Department of Electronics and Instrumentation conducted Departmental Advisory Committee meeting on 13th December 2013. Department discussed Mission and Vision, Programme educational Objective and related matters.

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VISION & MISSION OF THE DEPARTMENT

Vision: The department strives to enrich professionals of high competency in the arena of Instrumentation Engineering & mould them to adopt the crux of the matter in the field of Automation.

Mission: To prepare the students to envisage beyond the hypothetical thinking & belong to a new era of acquisition & application of Instrumentation Technology to meet the requisition of the changing World.

Program Educational Objectives

1. Graduates will achieve broad and in-depth knowledge of Electronics and Instrumentation Engineering relating to industrial practices and research to analyze the practical problems and think creatively to generate innovative solutions using appropriate technologies.
2. Graduates will make valid judgment, synthesize information from a range of sources and communicate them in sound ways appropriate to their discipline.
3. Graduates will sustain intellectual curiosity and pursue lifelong learning not only in areas that are relevant to Electronics and Instrumentation Engineering, but also that are important to soci-

Newly Joined Faculty in E&I Department: **Ms. Kavya**
(M.Tech in Process Control From GEC Thrissur)

FAREWELL To Ms. ANNA JOSEPH