


The LeCoPro consortium organises a workshop on “Learning Control for Production Machines” illustrating the outcomes of the IWT-SBO research project LeCoPro (Nr. 80032). For more information, contact FMTC via info@fmtc.be or visit www.lecopro.org.

Learning Control for Production Machines



Final workshop

August 26, 2013, Leuven – Belgium

09h30 – 10h00	Registration and welcome with coffee
10h00 – 12h00	<p>Overview of project results:</p> <ul style="list-style-type: none"> • Introduction (Wim Symens, FMTC) • Identification using operational signals (Prof. Johan Schoukens, VUB - Prof. Wouter Saeys, KULeuven) • Model-based learning (Prof. Jan Swevers, KULeuven - Prof. Robin De Keyser, UGent) • Model-free learning (Prof. Ann Nowé, VUB - Prof. Wouter Saeys, KULeuven) • Practical considerations of learning controllers for machinery (Gregory Pinte, FMTC)
12h00 – 13h00	Lunch
13h00 – 14h30	<p>Demo sessions:</p> <ul style="list-style-type: none"> • Badminton robot • Autonomous tractor • Hydrostatic drivetrain
14h30 – 16h00	<p>Plenary session on industrial challenges for learning control in various sectors (co-organised with Sirris):</p>  <ul style="list-style-type: none"> • Key note speech on Learning control for robotic systems (Prof. Robert Babuska, TU Delft) • Testimonials from industrial partners: <ul style="list-style-type: none"> • Picanol (Koen Maertens) • Spicer Off-Highway Belgium (Mark Versteyhe) • Case New Holland (Vincent Theunynck)
16h00 – 16h45	Thematic discussions in small groups on model-based or model-free learning
16h45 – 17h00	Closing session
17h00 – 18h00	Drink

LeCoPro project:

Advanced control methods, which significantly enhance the efficiency of production machines, are an essential element to satisfy the growing customer demands regarding both flexibility and productivity.

Traditional machine controllers have important limitations. Firstly, in many cases it is intricate or even impossible for the designers and operators to optimally tune the parameters of a traditional production machine controller due to the complex nature and the vaguely known dynamics of these machines. Furthermore, traditional control algorithms are not able to track changing system parameters and varying environmental conditions, which often appear in practical situations, and will consequently not adapt the control parameters accordingly. These drawbacks of traditional control algorithms, which result in suboptimal efficiency of the controlled machines, can be solved by the introduction of learning behaviour in machine controllers. This allows machines to automatically learn the optimal control parameters and adapt to variations in both process parameters and environmental conditions.

The realization of such 'intelligent machines' is the long-term goal of the LeCoPro project. To realise this goal practical methodologies for the design of learning controllers for production machines have been developed. The value of these learning techniques has been demonstrated on various demonstration cases.

During this final workshop of the LeCoPro project you will learn more about the detailed developments made within LeCoPro along with their implementations on a number of industrially relevant test cases. A discussion will also be organized focusing on industrial applicability of learning techniques. This discussion will start with a plenary talk by Prof Robert Babuska from TUDelft explaining the latest developments on learning control for robotic systems. The plenary talk will be followed by several testimonials from renowned industrial partners, already working towards learning controller implementations for their machines. Starting from these pitches thematic discussions in small groups on model-based or model-free learning approaches will be initiated.

Workshop location:

FMTC
Campus Arenberg
Celestijnenlaan 300D - bus 4027
B-3001 Heverlee

Directions on how to get there: <http://www.fmtc.be/en/getpage.php?i=29>

Who should attend?

Next to manufacturers of both mobile and stationary production machines, all producers of mechatronics systems are addressed, including automotive equipment, medical assistive devices, automation systems, etc.

The workshop targets engineering professionals facing machine controller tuning issues and researchers active in the field of control design.

Why participate?

- to learn about latest research results in model-based and non-model based learning control
- to get inspired by demonstrations on industrial cases and benchmarks
- to present, discuss and develop new project ideas on learning control
- to initiate contacts and new industrial R&D&I projects on learning control

Interested?

Attending the workshop is free of charge, but subscription is mandatory before August 15, 2013. To subscribe, send an e-mail to info@fmtc.be.
