IOF Consortium UAntwerp
Active in High-tech / Digital

NEXOR

CYBER-PHYSICAL SYSTEMS

University of Antwerp

FLANDERS MAKE
DRIVING INNOVATION IN MANUFACTURING

▶ We optimize design processes for mechanics, control applications and embedded software, on the one hand, and on the other hand, for machines themselves. For both, we use various techniques including digital twins.

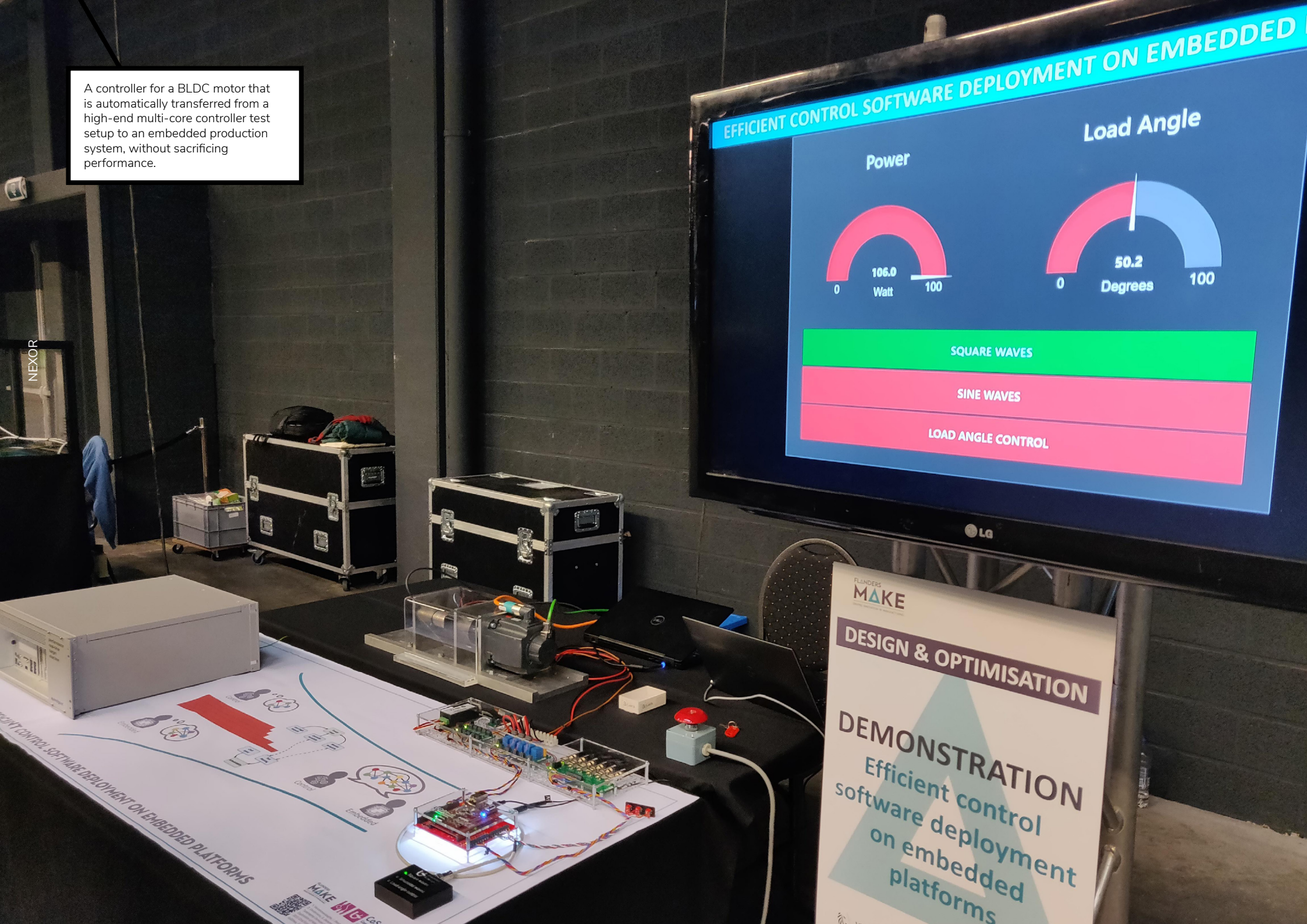
Cyber-physical systems, that's what NEXOR is all about. Prof. Serge Demeyer, Spokesperson for NEXOR explains:

"NEXOR specializes in cyber-physical systems, such as high-tech machines, robots, production machines and vehicles. You could think of these systems as moving computers that interact with the real world at high speeds. The interaction between man and machine is therefore always central.

With the unique mix of complementary knowledge within the IOF consortium, we conduct both basic research and applied research in response to specific business challenges. On the one hand, our expertise lies in optimizing the development processes of cyber-physical systems. In addition, we have specialized know-how for creating, applying and selecting sensor systems for such high-tech machines. Efficient systems, safety and quality are our spearheads. We also always include user interaction and ergonomics in our projects.

Where current tools and applications stop, that's where NEXOR takes over. And because we apply techniques that have not yet reached the state-of-practice, we help the companies we work with to be maximally innovative."

NEXOR is open to helping with various technological challenges. Prof. Serge Demeyer is your primary point of contact.



A controller for a BLDC motor that is automatically transferred from a high-end multi-core controller test setup to an embedded production system, without sacrificing performance.

NEXOR is ...

Simulation · Model building · Digital twin · Machine optimization · Signal processing · Control optimization · Software quality · Sonar · Radar · Industrial cameras · Embedded Systems · Human machine interfaces

NEXOR allowed us to help our customers minimise the total cost of ownership of their machines. Moreover, based on their developments, we now create servo driven technology in fewer iterations, significantly reducing cost and risk of new developments.

Quote from Nedschroef Machinery

Research groups and expertise

NEXOR combines the expertise of various research groups within UAntwerp:

AnSyMo (Antwerp Systems and Software Modeling)

AnSyMo investigates the foundations, techniques, methods and tools for the design, analysis and maintenance of software-intensive systems.

Cosys-lab (Co-Design for Cyber-Physical Systems)

Cosys-lab focuses on co-design for Cyber-physical systems, ranging from the development of new sensor techniques, embedded systems, and modeling techniques to the design of energy-efficient mechanisms.

InViLab (Industrial Vision Lab)

InViLab develops machine vision techniques that tackle challenges in industry and society and creates new imaging technologies for smart health, pollution monitoring, heritage conservation and sustainable materials, with a view to better quality control, automation and safety.

ENM / APL (Engineering Management / Active Perception Lab)

The work in the Active Perception lab focuses on the development of biomimetic sensors to support intelligent interactions with the environment by autonomous systems.

Product development

The mission of this research group is to advance scientific knowledge that enables the creation of innovative products to improve human well-being.

NEXOR is also a gateway to Flanders Make. This way, we can not only connect with other labs with complementary expertise, but in specific cases we can also look at related subsidy channels.

Collaboration is possible through...

Co-development / joint research · Contract research · PhDs / Postdocs · Use of equipment and facilities · Master theses · Customized training · Service contracts · Internships

Contact NEXOR

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Unique features of our equipment

NEXOR has high-end thermographic and hyperspectral cameras and other infrastructure that can help companies with their industrial design and automation. A selection of the unique equipment:

- Demo production line for AI robots (in collaboration with Flanders Make)
- Measuring devices for electronics
- Motion lab with extensive motion capturing system
- Vision systems, including high-end thermographic and hyperspectral cameras
- Camera selection setup (unique)
- NVH measuring equipment (noise, vibration, harshness)
- Makerspace with rapid prototyping machines (3D printing (various methods and materials), knitting machine, embroidery....)