MECHANICS AND CONTROL OF MOTION SYSTEMS (MeSA)

Mission
• Enhancing application-driven research, education and training in the broad field of mechatronics and logistics with and for engineering technologists (industrial engineers)
• Building a bridge between ‘state-of-the-art’ and ‘state-of-the-practice’

Team
13 staff members

Research topics
MeSa research group focusses on technology for both internal and external logistics:
• Industry driven analysis and synthesis (modelling, design, control and optimization) of mechatronic (drive) systems
• Safety driven and efficient design of logistic systems and procedures
• Techsel: In this project the impact of state-of-the-art vehicle technology is evaluated on traffic safety and on the environment. This allows city councils to introduce access restrictions in an economically responsible way for all vehicles that perform poorly in these domains.

LEAN manufacturing
Our Lean Learning Academy
• develops knowledge, tools, lean games and other didactic equipment concerning Production management in general and Lean management and Quick Response Manufacturing (QRM) in particular. We therefore cooperate intensively with the local work field and with foreign companies and universities within European and other projects.
• shares and applies her knowledge about Production Management in the work field to improve (production) processes. We therefore organise a series of training programmes for professionals at our university, but also in-company workshops on-demand.

Contact: www.leanlearningacademy.be
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Industrial motion systems
Implementation of advanced motion control algorithms for industrial servo controllers.
- Feedforward (trajectory or model based)
- Input Shaping
- Model Based Controllers
- Energy Controllers
- ...
On demand training, in-house and at your site.

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Quality standard for e-bikes
TETRA project 'TGVelo' with 25 partners
- Quality testing (brakes, lights, ergonomic aspects,...)
- Research on daily use of e-bikes (convenience,...)
- Aim: establishing an e-bike quality label
Web: sites.google.com/site/tgvelowebsite

Comfort and safety of e-bikes
Current electric bikes are conventional bikes with minimally adapted design to host an electric motor unit and a battery. However, external forces applied during cycling are differently distributed in case of an electric bike and also the preferred sitting position is different. That’s why a new geometry should be found. The fundamental difference in external forces working on a manual and an electric bike is being studied in order to develop an optimized geometrical design for an electric bike.

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Cargo bike stability
The use of cargo bikes by private persons and by professionals has a strong growth. With two-wheel bikes, the falling risk can be drastically reduced by choosing an intrinsically more stable bike. Also three- and four-wheel cargo bikes with moving loads dare to tip over when taking a turn at too high speed. In this research project, the problem of stability is studied conceptually and turned into practical design guidelines for manufacturers of manual and hybrid cargo bikes.

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