Department of Systems and Control Engineering Research Projects

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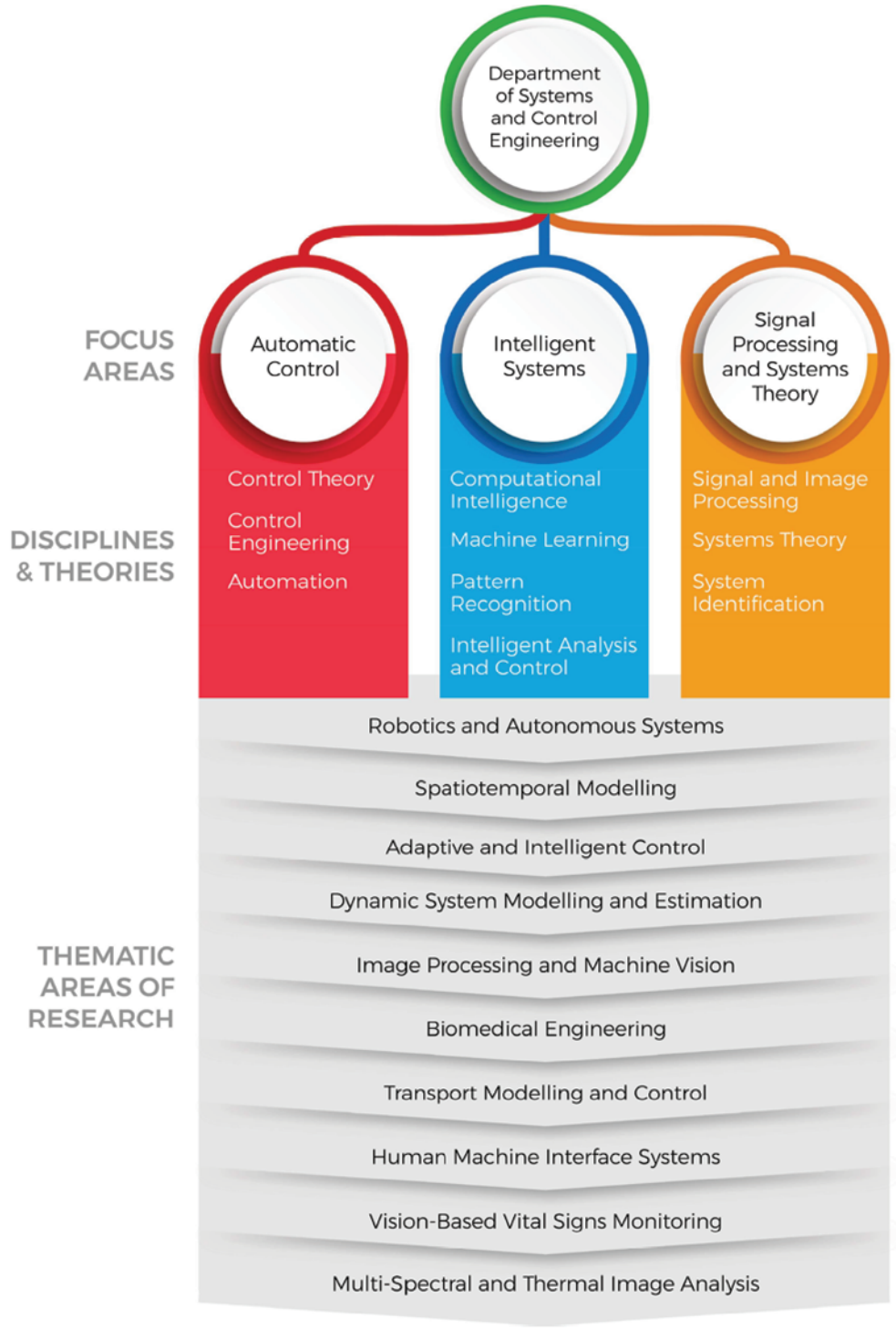

THE TEAM

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Smart Wheelchair

Upgrading a standard motorized wheelchair into a smart wheelchair

The smart wheelchair makes it easier for the user to drive and navigate through narrow spaces and doorways. The user only needs to indicate the desired destination from a plan of the area. The smart wheelchair will choose the best path to arrive to the destination, detecting and avoiding any obstacles along the way.

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Ride+Safe

Design and Implementation of the Control System for a Physical Motorcycle Simulator

This project involves the design and implementation of a control system for a Stewart Platform (hexapod) that will carry a mock - up motorcycle along with a user emulating the physical dynamics of a riding simulation.

This project is carried out in collaboration with the Department of Industrial and Manufacturing Engineering.

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VRSurge

Virtual Reality Surgical Training Simulator

VRSurge proposes the use of 3D Virtual Reality and immersive technologies to develop a simulator for training of medical surgeons and assistants. The platform includes physical mock surgical instruments which transmit back tactile feedback of the forces and sense of touch as felt by surgeons during real interventions. The use of such techniques makes the simulator very realistic and enhances skills acquisition for the trainees.

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Forensic Analysis for Child Sexual Abuse

Using Artificial Intelligence to support police investigations

This project uses computer vision and artificial intelligence (AI) to detect sexually explicit content in images and videos. The project allows law enforcement agencies to process large volumes of image and video content quickly and automatically, thus assisting the detection and investigation of child sexual abuse.

This project is carried out in collaboration with the University of Leon and the Malta Police Force with the support of the European Commission under the 4NSEEK project with Grant Agreement 821966

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IoT4UTC

An Internet of Things Solution for Urban Traffic Control

Building on the Department's expertise in Intelligent Transportation Systems, IoT4UTC proposes to optimize traffic flow in urban regions through the use of Artificial Intelligence (AI), while leveraging on the connectivity and processing power of Internet of Things (IoT) solutions.

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Leggiero

A piano students' companion

Leggiero puts together the Department's expertise in computer vision and music signal processing to develop an application that can analyse the music score being played and provide feedback to music students who spend long times studying and practicing without supervision thus complementing the teacher's instruction and facilitate the learning of a musical instrument.

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WildEye

Eye-gaze Tracking in the Wild

WildEye exploits the computer vision and Artificial Intelligence (AI) expertise of the Department to develop novel vision-based eye-gaze tracking methods for human-computer interaction. The project specifically addresses challenges related to tracking under real-life conditions, which include the handling of head movement and non-rigid face deformations.

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EyeDesign

Eye-gaze Tracking for Collaborative Design

The EyeDesign project leverages the Department's expertise on vision-based eye-gaze tracking, for the development of a platform that supports spontaneous multi-user interaction to improve communication during the initial stages of collaborative design.

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POINTact

Natural Interaction for Smart Environments

POINTact develops novel vision-based methods to extend the interaction space to the user's environment, by permitting persons with impaired mobility or speech to activate electronic devices within their environment using natural gestures of the eyes, head or the body pose.

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BrainApp

Brain Controlled Application

BrainApp exploits the expertise of the Department in brain signal analysis, signal processing and Artificial Intelligence (AI) to develop a brain-computer interface (BCI) which allows a person to communicate and control devices using brain signals directly.

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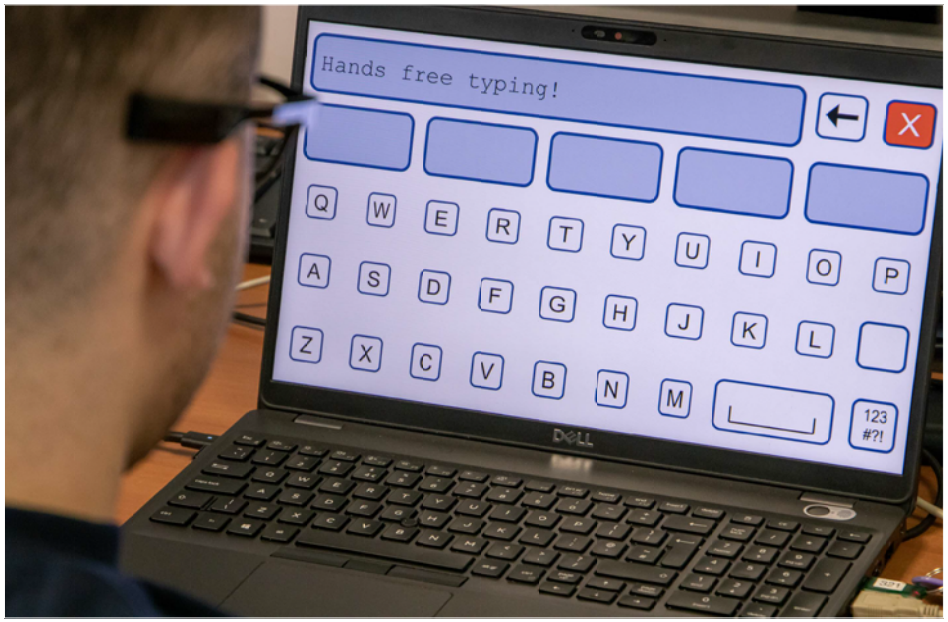
EyeCon

Eye based Control

EyeCon is concerned with an alternative human-machine interaction modality, in particular using the electric potential around the eye to permit eye gaze tracking without cameras. The project also aims to compensate for any natural head movements, thus allowing the user to interact seamlessly with computer applications.



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SMARTCLAP

A Smart User-Centred Product Service System for Evaluating and Developing Functional Hand Skills in Children with Cerebral Palsy

This project involves the design of a device to be used during occupational therapy for children with cerebral palsy, so as to increase the motivation of the child in performing therapy exercises concerning hand movements.

The project is carried out in collaboration with the Department of Industrial and Manufacturing Engineering.

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Collaborations

Collaborating Partners

The Department collaborates with international and local entites on projects in the following areas:

Image forensics and cybersecurity

- University of Leon, Spain
- Spanish National CyberSecurity Institute (INCIBE), Spain

Augmented and virtual realites

- University of Applied Sciences, Berlin, Germany

Stroke rehabilitation

- Katholieke Unversiteit Leuven, Belgium

Computer vision

- University of Oxford-Brookes, UK

Neuroscience

- Italian Natioanl Research Council (CNR), Institute of Neuroscience

Robotics and automatic control

- Universite du Havre, France
- University of Lorraine/CNRS, France

Mechatronics

- Brno University of Technology, Czech Republic

Systems and control

- The University of Sheffield, UK

Control and biomedical signal processing

- University of Catania, Italy

Automotive sensing technologies

- Methode Electronics Malta Ltd.

General hospital

- Mater Dei Hospital

Software and application development

- Seasus Ltd., Malta
- 88 Malta
- Keen Ltd., Malta

The Department welcomes ideas for collaborations.

Do get in touch!

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