

CONTROL SYSTEMS DESIGN

PRECISE AND RELIABLE CONTROL SYSTEM SOLUTIONS FOR OPTIMIZED PERFORMANCE



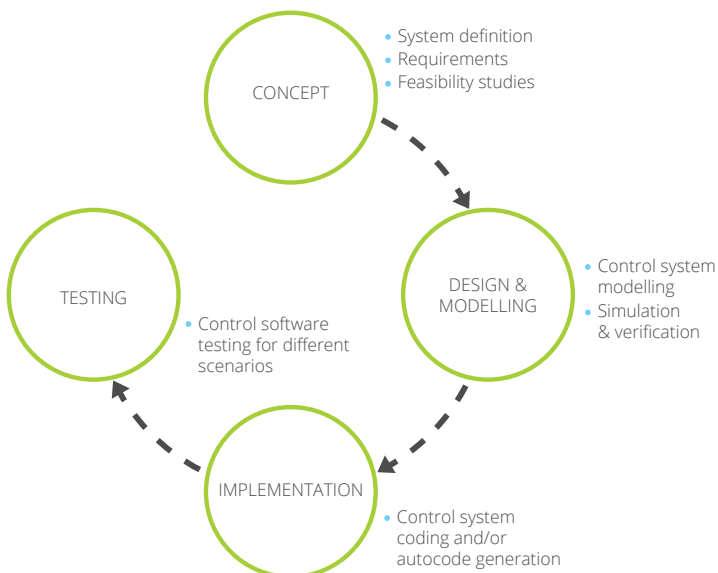
ADVANCED CONTROL SYSTEMS DESIGN

To optimize performance and costs while also minimizing the risk of human errors, engineering projects require precise and reliable control solutions for physical systems.

DIS/CREADIS has extensive knowledge and thorough experience within advanced control systems that helps you keep up with the fast paced global digital development and meet market demands.

We have designed control systems for application within a variety of areas such as power and energy, mechatronics and robotics, automotive, aerospace and process plants.

DEVELOPMENT PROCESS



COMPETENCES

- Classical PID Control
- Linear/Nonlinear Control
- Model Predictive Control (MPC)
- Linear Quadratic Gaussian Control (LQG)
- Single-variable (SISO) and Multivariable (MIMO) Control
- Robust & Adaptive Control
- Fault Tolerant Control (FTC)
- Linear Parameter Varying (LPV) Systems
- Field-Oriented Control (FOC) & Direct Torque Control (DTC)
- State estimation (e.g. Kalman Filtering)
- System identification
- Digital Signal Processing methods

TOOLS, PROCESSES AND PLATFORMS

- Modeling & Simulation Tools: Matlab & Simulink (inc. Stateflow), Octave, Scilab, LabView
- C/C++/Python/VHDL programming languages
- Visual Studio
- Embedded systems: microcontrollers & FPGAs
- State-of-the-art research & concepts
- Reverse engineering
- Control software modelling & development
- Software development workflows (GIT, JIRA)
- Software testing (MIL, SIL, PIL, HIL)

CONTROL SYSTEMS DESIGN

HOW CAN WE HELP?

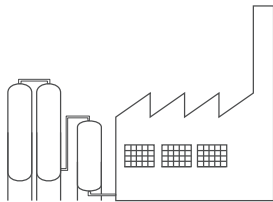


AEROSPACE



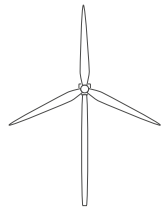
- Modeling aircraft nonlinear dynamics, state estimation, flight and propulsion control system design
- Design of Guidance, Navigation & Control (GNC) systems, motion tracking in the presence of failures
- 6 DOF control of aerial vehicles (e.g. UAVs), Attitude and Orbit Control Systems (AOCS) for satellites

PROCESS PLANTS



- Automatic process control systems (with many control loops, variables, parameters and constraints)
- Control design for Heating, Ventilation & Air Conditioning (HVAC) systems, chemical processes
- Distributed control systems (PLC/SCADA for process control, conditioning and monitoring)

POWER AND ENERGY SYSTEMS



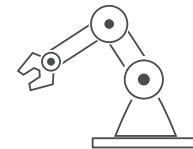
- Wind turbine systems (pitch/torque control, load assessment, power calculation (AEP))
- Electrical machines and drives (converter control, scalar/vector control, model-based control)
- Active rectifiers and filters (over compensation, power factor improvement)

AUTOMOTIVE



- Vehicle chassis control – vertical & lateral motion, suspension control, body control
- Electronic stability program (ESP), Adaptive Cruise Control (ACC), An anti-lock braking system (ABS)
- Powertrain Control Module (PCM), Battery Management System (BMS)

MECHATRONIC AND ROBOTICS



- Precise and high speed 3D positioning (nonlinear dynamics control, decoupling, vibration damping)
- Trajectory planning, optimal servo control (in the presence of uncertainties, disturbances and noises)
- Sensing and actuation systems integration/ fusion, signal and image processing algorithms

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