Training program

The trainings are a general introductory course based on practice-oriented research. The handouts of the course are made available as course material.

General (01/06/23 or 05/10/23)

- The electromagnetic spectrum.
- Antennas (wire, loop) and the related electric and magnetic field, frequency and wavelength.
- Spectrum of signals and Fourier Transform (Time/Frequency).
- EMC: conduction and radiation (with a side step to the standards and test methods).
- Common Mode/Differential Mode.
- Introduction to transmission lines.
- Impedance of a wire.
- Principles of equipotential.design

PCB level (08/06/23 or 12/10/23)

- HF behaviour of components, with a focus on filters and decoupling C's.
- Placement of decoupling C's and filters.
- Ferrites at the PCB level.
- Impedance controlled design at high bit rates.
- Crosstalk.
- Multilayers and the feedthroughs between them.
- Seperation of systems / signals at the PCB level (with corresponding GND layer).
- GND layout and interruption/ bridging of the ground planes.
- Power lines and their filtering (pulsed currents).
- Ground loops and coupled lines in layout.
- Board Level Shielding (BLS)

Systems (15/06/23 or 26/10/23)

- Coupled wires and routing against chassis (mitigation of CM).
- Crosstalk and chassis and routing close to chassis.
- Filters and CM chokes, and correct mounting
- Pigtails and cable routing between compartments.
- Introduction to shielding enclosures, with effects of openings (e.g. display), and seals/gaskets
- Shielding of cables and continuity at the termination connectors.
- GND noise due to wrong grounding(s).
- Cable trays and the associated specs versus cables.
- Separation of systems and signals.
- Inverters and motors, and the bearing current.
- Pulsating currents from batteries.
- CAN bus as an example.
- ESD and touchscreens.

Systems (15/06/23 or 26/10/23)

Training program Johan Catrysse