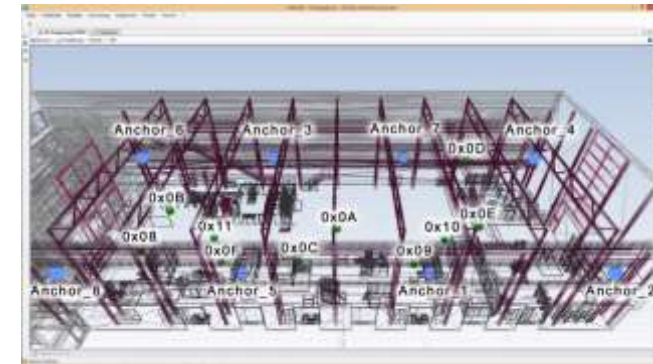


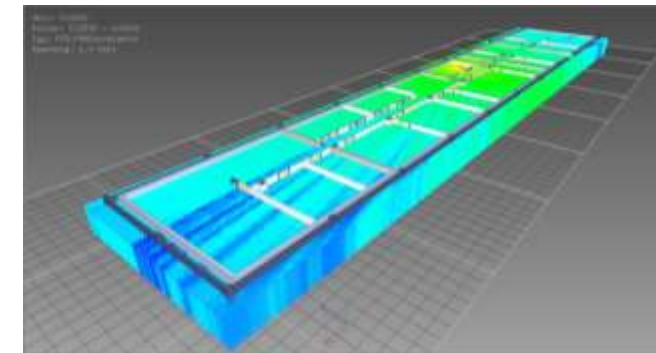
Use Case 15: IIoT Robustness Simulation

Problem/goal	<ul style="list-style-type: none"> • Increase robustness of wireless networks in production/IIoT environments • Put wireless networks faster into service • Enable SMEs to build up robust, reliable, cost- and time-efficient IIoT infrastructure
Potential users	Integrators of wireless networks in IIoT environments, IIoT manufacturers, researchers
NACE	C33.2 Installation of industrial machinery and equipment J61.2 Wireless telecommunications activities
Description	Wireless networks (WN) are essential in production/IIoT environments. Mobile robots, edge devices, or Automated Guided Vehicles need to communicate. Such networks are prone to physical changes of the environment and cyber attacks. This use case simulates the WN behaviour in IIoT infrastructure and validates it against real environments. The simulation results in an optimal positioning of the network devices and evaluates fallback strategies for cyber attacks.
Hardware	Wireless Sensor Network (IIoT devices)
Software	Software <i>d3vs1m</i>
Standards	IEEE 802.15.4 (LR-WPAN), IEEE 802.11 (WLAN), CUDA, OpenCL, web standards (WebGL , HTML5, CSS3)
Possible benefits	Reduction of setup time of WSNs in IIoT infrastructures, Simulation of robustness against wireless communication failures (unwanted system behavior or criminal attacks), Optimization of positioning the network devices (node distribution)
Partners	Fraunhofer IWU , LSEC (Belgium), Centria (Finland), EDI (Latvia)

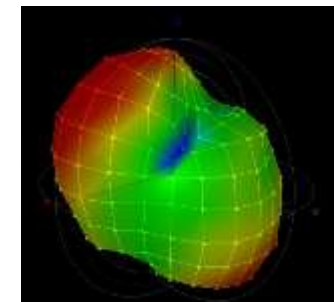
<https://github.com/adriansinger87/d3vs1m>



Radio simulation with 18 nodes inside E³ Research Factory



3D radio map in office environment



3D simulation of 868MHz PCB antenna