Master Thesis title: Sidelink Communication in Industry 4.0 Scenarios

Description of the Master Thesis: Up to now, devices have always been hierarchical in their communication but 5G will enable the direct connection between devices which is known as sidelink communication. Since the communication is restricted to only one hop the latency will drastically decrease which is highly favorable in the Industry 4.0. The base-station (gNB) is assumed to be installed at the corner in the factory. Also, the direct sidelink communication between automated guided vehicles will re-use the uplink resources for more spectrum efficiency. Up to now, for the downlink and uplink, the resource allocation and link adaptation is controlled by the network, however in sidelink the device will have more control on how and when to use the network resources.

The main idea of the Master Thesis would be to study and analyze the standardized resource allocation procedure for the scenario of mode 2 in-coverage for a group of automated guided vehicles carrying a piece or factory equipment cooperatively.

Then once the analysis is done, another goal would be to propose enhancements to the existing autonomous resource allocation procedure to meet the stringent QoS requirements for the Industry 4.0 use cases.

Development of the simulator could be in MATLAB or Python.

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