5G & Machine-to-Machine Communication

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1 Description

In this thesis, you augment a simple robot with WiFi and LTE support, and program the robot such that it is controlled remotely over the aforementioned wireless interfaces. To this end, a Raspberry PI card has to be integrated with the robot, which is used to enable dual connectivity for the robot. KAU will provide a 5G ATSSS prototype that has been implemented together with Deutsche Telekom. The solution needs to be integrated with the Raspberry PI and the robot control. ATSSS is a system that schedules the network traffic of the robot over the different interfaces, allowing for simultaneous usage of WiFi and LTE. The dual connectivity is terminated in a docker container and forwarded to the robot controller. Your solution should allow for remote operating of the robot which should be as efficient, *when wireless conditions are good*, as when it would be a locally managed robot. For the evaluation, you should evaluate the performance of different packet scheduling and reordering mechanisms on the timeliness of the robot control, depending on the wireless link quality and the network characteristics between the ATSSS termination point and the robot control endpoint. The system setup will — *if successfully created* — be used in ongoing 5G research at Karlstad University.

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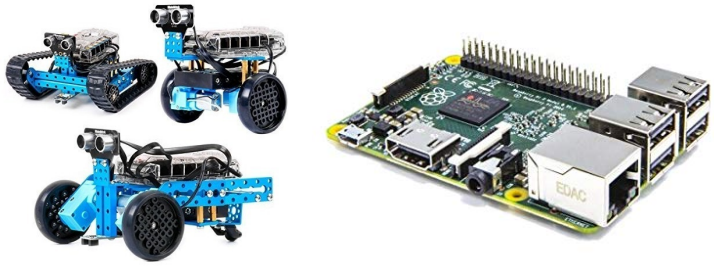

(a) Robot (b) Raspberry PI

Figure 1: Hardware components

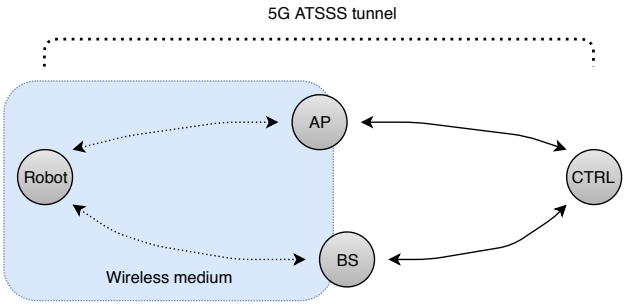

Figure 2: Topology