COST Innovators Grant IG15104

Industrial Machine Monitoring Unplugged Network (IMMUNet)

MINUTES

Fifth CIG Team and Scientific Meeting

Microsoft Teams (*online*)

14-15 June 2021

Day 1: June 14th

15.30 – 16.30: Status of the project

Chiara Buratti reported about the Virtual Networking Support grants. Chiara Buratti will check with the secretary how the reporting of the final activity for such grants should be done.
Chiara Buratti reported about the status of the contacts with CRIT. IMA s.p.a has filled the questionnaire providing interesting feedback on the IMMUNet system. The questionnaire is available at the link: https://docs.google.com/forms/d/1SuYExKTFXVi3nCEvmX9_bNcf7pUdm49AlOvw-eY4SBk/edit#responses. In summary, they are interested into the system but they suggest us to make a partnership with some large company well-known in the automation field.
Chiara Buratti reported about the recent contacts with BI-REX. CNIT (through Wi-Lab) has just signed a contract with BI-REX, that will allow CNIT to start contacting automation machine companies to gather advices on Industrial IoT applications and requirements. Starting form next week Roberto Verdone will contact a list of companies already identified. Outcomes of these interviews should be useful to IMMUNet system design and to finalize the business plan.
In addition, thanks to the above contract, IMMUNET will do a demo of the system in Bologna at Opificio Golinelli on September 30.
Chiara Buratti reported about the last contact with Embit. After some other contacts and meetings, Embit decided not to take part of the startup.

16.30 – 17.30: Definition of a strategy on how to move on

Chiara Buratti led the discussion about how to proceed with the business plan editing and startup creation, given the fact that Embit is not interested anymore to take part of the startup.
It has been decided to proceed with the editing of the business plan, assuming another hardware partner will be found by the end of the project or just after the end of the project.
The discussion then moved to the following topics (details have been included in the business plan):

- Name of the startup – different proposals have been done – the final name will be s elected in the next weeks
- Team structure

- Governance and ownership

17.30 – 18.30: Technical Details about the demo to be performed in September

Chiara Buratti reported about details of the demo to be setup.
Konstantin Mikhaylov reported about the status of the BOM preparation, to proceed with ordering the material and producing devices for the demo. Boards layout will be available in one week.
It has been decided to use accelerometers and temperature/humidity sensors and to focus on the different functionalities of the system (reading, writing, reading history) when considering a star topology.

Day 2: June 15th

9.00 – 10.00: Discussion about next steps related to the technical developments

Laurent Clavier presented the achievements in terms of data aggregation and compression techiniques. The selection of a proper compression strategy is strictly dependent on the application requirements, so final decision about the strategy to be used will depend on customer wish. In the next months UoLille will proceed with the testing some of these strategies on the IMMUNet system. In particular, it will be check the cost in terms of energy consumption of the compression itself, when compared to the energy saved by sending less data on the radio channel.
Guillaume Villemaud presented the status of the measurements of the energy consumption of the boards in the different states of the communication. Results report about the power/current consumed during default and writing states. The reading functionality is still to be checked because of the lack of sensors on the board. INSA will go on performing these measurements, with the aim of showing some numerical results during the demo in September. Some work to try to understand the RSSI values measured will be also performed, since these values seems to be wrong.
Carles Anton reported about the status of the work on coding. Library for the implementation in C language of the outer encoder has been identified. However, since the integration is request on some effort and it is up to Unibo, it has been decided to postpone it after the demo in September and to show during the demo only simulation results.

Two parallel sessions:

10.00 – 13.00: Hands on session with Giampaolo

The hands-on session had the aim of solving the doubts/issues that were currently present in Lyon/Lille:

- Lyon: The system is working as expected. The hands-on session has covered the following topics:
    1) Enlarge the TimeOnAir of the association packets sent by the tag: Giampaolo showed the line of codes where the packet size can be increased or where the SF can be enlarged;
    2) Change the transmit power: Giampaolo confirmed that Lyon has correctly identified how to change the transmit power;
    3) Produce dummy data to let the Reading work: Giampaolo explained the modifications that should be done in the two codes (tag and G2) to let the Reading work;
    4) Discussion about the measured RSSI values: Giampaolo shows the Semtech function that is used to read the RSSI value so that its correctness and/or working principle can be verified by Lyon;
    5) Reduction of the power consumption in Idle mode: Giampaolo showed how the actual low-power mode is implemented so that Lyon can work in optimizing it;

- Lille: The system is not working properly. All the hands-on session had the aim to solve the problem. After some debugging, the problem has been found: Lille has used the first shield schematic produced by Konstantine and thus there is the conflict problem between Ethernet and the SPI2. Due to this pin conflict, G2 gets stuck. The agreed next-steps are then the following:
    1) Produce a new shield by using the latest schematic produced by Konstantine so that G2 can work as expected. Giampaolo suggests to ask Lyon for further details since their shield are working as expected.
    2) In the meantime, Lille can work in connecting some sensors to the tag board since the pin conflict is not present in the latter. Giampaolo indicates the step-by-step procedure to add the code which manages the sensors and how to test it.

10.00 – 13.00: Discussion about the Business Plan finalization

Konstantin Mikhaylov discussed about the IMMUNET budget. A details files including all expected incomes and outcomes for the next two years has been drafted. The file will be included in the business plan.

13.00: Close of the meeting