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| DEEC_medium.jpg | **Big Data Measuring Systems** |

**LAB 4 Short Report: Cloud Sensor Platforms**

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| **Week day** | **Date** | **Hour** | **Group** | **Students Numbers** | |
| Friday | 24/4/2020 |  |  | Paolo Frazzetto | 94942 |

**Step 1**

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| **Channel ID** | **1058393 (Features & Analysis)**  **1065024 (Customer view)** |

**Step 6**

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| **JSON payload size** | **95 byte** |
| **MSGPACK payload size** | **79 byte** |
| **Observations:**  As expected, the same entry encoded as MSGPACK payload is smaller in size than the corresponding JSON file. | |

**Step 10**

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| **Post-processing for rotation speed**  The rotation speed frequency follows a linear behavior proportional to the supply voltage. The post-processing consists of the inversion of this linear model with . Next, the main frequency is the angular velocity of the shaft that gets divided by for the gear ratio and again divided by to convert it from to . |
| **Post-processing for unbalancing weight**  The amplitude of the weight feature has been modeled as taking into account the double dependency on the rotating speed and unbalancing weight. If (an arbitrary threshold) the inverted formula gives the estimated weight, that otherwise is set to zero. |
| **Post-processing for gear’s health condition**  Similarly, the health conditions follows that leads to a rounded estimate of the health if the feature is heuristically greater than , otherwise it is set to |

**Step 11**

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| **Motor state variables evolution**  The motor state variable follows a repeated cycle of minutes. The speed increases linearly up to half cycle and then it decreases with the same behavior, thus resulting in a triangular wave with little noise. At around the maximum speed, from roughly minute 4 to 7, the unbalancing weight is added. The estimated weight is firstly and after one minute it reaches . Here however the post processed points are noisier, so better parameters or model would be required to get a more accurate estimate. Concerning the health, it is at top conditions on the first half of the cycle and then it decreases exponentially to |

**Conclusions**

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| The experiment has been carried out successfully. The sensor and feature extractions have been integrated in the ThingSpeak platform by means of dedicated channels and visualization tools. Moreover, cloud computing was used to post-process the sensor data similarly to what happens in real life scenarios, where cloud computing is exploited for remote monitoring, analysis and maintenance. |