IoT Clusters Platform for Data Collection, Analysis, and Visualization Use Case

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Climate change is happening, and many countries are already facing devastating consequences. Populations worldwide are adapting to the season's unpredictability they relay to lands for agriculture. Our first research was to develop an IoT Clusters Platform for Data Collection, analysis, and visualization. The platform comprises hardware parts with Raspberry Pi and Arduino's clusters connected to multiple sensors. The clusters transmit data collected in real-time to microservices-based servers where the data can be accessed and processed. Our objectives in developing this platform were to create an efficient data collection system, relatively cheap to implement and easy to deploy in any part of the world. Since we have completed the first part, we are implementing a study case for a field used of the platform. Thus, we are implementing an environment monitoring technology base on weather data. For this study, the platform will collect real-time environmental data using sensors (Temperature, humidity, light and ultraviolet sensors, and other sensors). We are setting those sensors in relatively limited superficies due to resources problem. Next, we will use this data to find patterns in weather changes using Machine and Deep learning techniques since these environmental data come from a designated area. The main objective of this part is to find a weather pattern using collected data specific to this area. Data collected during this research and the IoT platform are available on campus for students to use for their class projects or future research. Currently, we are in the data collection process. We also evaluate the degradation and environmental effects on devices and sensors used. This study case is a needed step in the IoT Clusters Platform for Data Collection, Analysis, and Visualization research project. At the end of the project, the data collection framework from it will be efficient and cost less.