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Genetic algorithm for forecasting atmospheric air quality in Gdansk**Cezary Orłowski, Adam Ruminski***WSB University, Gdansk, Poland*

The use of Internet of Things nodes to assess air quality is becoming an important utilitarian and research problem. That is why so much work is devoted to both air quality data collection and forecasting capabilities. Therefore, the article is devoted to the possibility of collecting data in message brokers in Edge-Fog-Cloud networks and their processing of both integrated services as a genetic algorithm and external services, such as meteorological data.

The aim of the article is to show the processes of building a genetic algorithm for forecasting data on air quality in Gdańsk. The article is of a technical nature, showing on the one hand the necessary resources for the forecasting process, including air quality and atmospheric data. The structure of the Apache Kafka message broker collecting data from IoT nodes and reference devices and the structure of the Application Programming Interface for obtaining data from external air quality services are presented. It then shows the processes for creating phenotypes from the data collected in the topic for testing the genetic algorithm and its subsequent use. The construction of the genetic algorithm and phenotypes is carried out with the use of containerization processes carried out on clusters of virtual machines. An example of a cluster construction using the IaC -Infrastructure as Code approach, which allows the forecasting process to be treated as a sequence of commands from an IaC file, is shown. This file has been implemented in the Terraform environment.

Biography

Cezary Orłowski- Professor of computer science at WSB University in Gdańsk, head of the computer science group. He is a specialist in the application of IoT systems, Big Data pre-processing methods especially fuzzy and neuro modelling, building Infrastructure as a Code (IaC) and digital transformation in environmental engineering. He is also responsible for the Information Technology Research Laboratory- IBM Centre for Advanced Studies (CAS) using software delivered to the Department by IBM (main business and scientific partner). Additional information about book writing history, journal editorships, board memberships and any current leadership roles

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