ABSTRACT

The bus transportation service is an important part of a cities infrastructure and, as transit keeps increasing, the need to optimize this service grows. The optimization of bus routes, which is a complex combinatorial problem, commonly known as the Bus Routing Problem, cannot be solved through exact mathematical methods in useful time. By creating methods that are able to design optimized bus routes, the overall public transportation service quality would improve greatly. We researched the literature for methods that had already been applied to other routing problems, looking to find a good candidate method for the Bus Routing problem. We developed a version of an Ant Colony System that was able to, given a network and the distribution of passengers, compute a bus route, using one bus. With the intention of expanding our algorithm to work with multiple buses, we improved our approach so that two buses could be used, achieving improved results.

FLOWCHART

**Get the location and speed bus from GPS module**

**GPS initialize module**

**GPS value send to IOT bylnk server through the ESP32 using wifi**

**Bylnk server recived data using internet**

**Display the data on the mobile application**