BloomBus Project

Nicholas Ashenfelter and Michael O'Donnell
Bloomsburg University

Background

The idea for a tracking bus system was first proposed years ago. The project was inspired by colleges and cities that have their own transportation tracking. The idea to use an ANN was introduced after attempts to use radio proved insufficient.

Objectives

Ensuring that people know when a bus will arrive at a stop allows for better planning and better shuttle service management. When preparing for their day, students will be able to check the bus app and plan accordingly. The shuttle service will check the drivers in real-time and see which are properly doing their jobs. Here, an ANN will be used to perform the predictive tasks.

Hypothesis

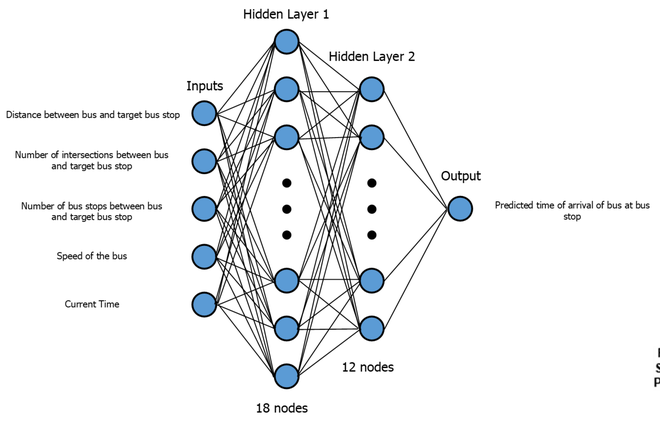
An ANN can predict when a bus will arrive at a stop by analyzing data and then create a mathematical model; an ANN will use this model to determine output for any valid input. After training on bus route times and other related data, an ANN can accurately predict when a bus will arrive at any stop.

References

1. Gurmu, Zegeye, et al. Dynamic Prediction of Travel Time for Transit Vehicles in Brazil Using GPS Data. 2010
2. Kabir, Miraz, et al. Public Vehicle ETA System Using Machine Learning. Apr. 2018, p. 87.
3. Google for Firebase Systems

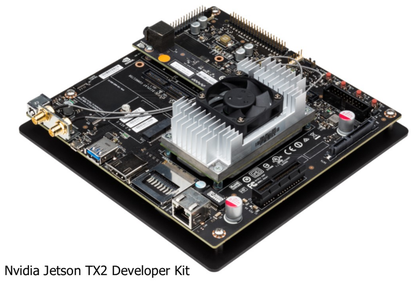
Results

BloomBus-AI



Hardware

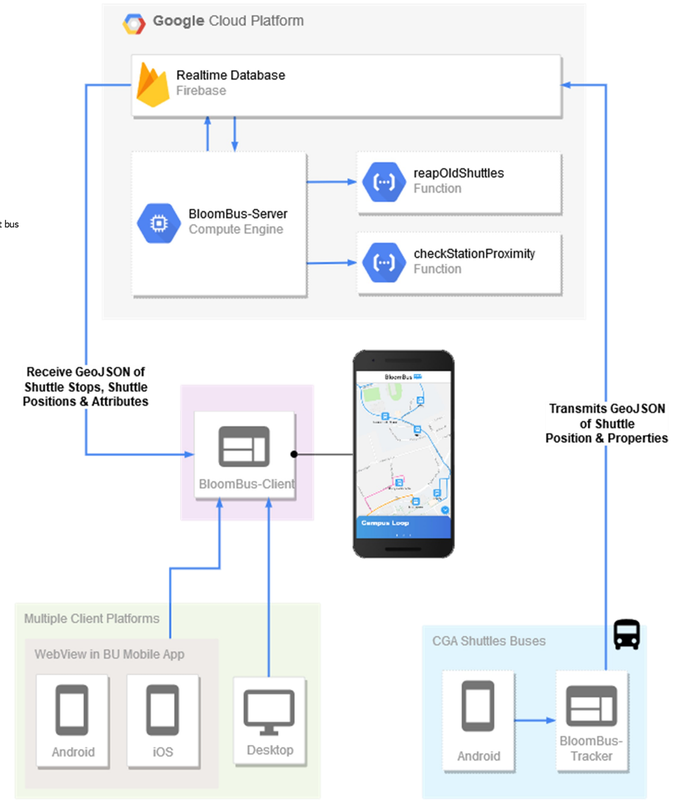
While the Jetson TX2 will be used to train our AI, the Galaxy J3 Star will be used on the campus buses with our tracker app to monitor the current bus locations.



Nvidia Jetson TX2 Developer Kit

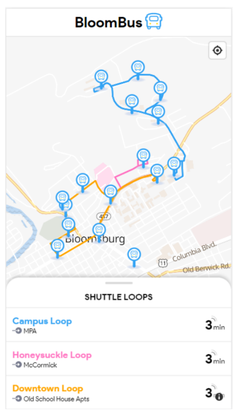
Samsung Galaxy J3 Star

Project System Diagram



Front End

Mobile View



Desktop View

The Client Application has full map view over all routes, map bounding, zooming, stop icons and real time moving bus icons.

Back End

Firebase

We have been using firebase for our backend/databasing needs. This stores json files with bus tracking and loop data.

This research was supported and approved by the BU Community Governance Association

Conclusion

We have not trained the ANN yet. However, we have learned about ANN, SSH, JavaScript, Experimental Hardware, Documentation and more. We have made progress towards setting up the ANN. We have made a great deal of progress on the Client App and the Server that will run everything.

Future Directions

We still need to train the AI once we are able to collect data from the shuttles.

We need to collect data from the shuttles once they are running loops during the school year.

We will need to set up the hardware onto the Buses

Improvements and Refinements will be made to the Client App and the Server as the Server is finalized.

More Information

Visit us at https://github.com/BloomBus or email us at

BloomBus@huskies.bloomu.edu

for more information about the project. Or use this QR code: