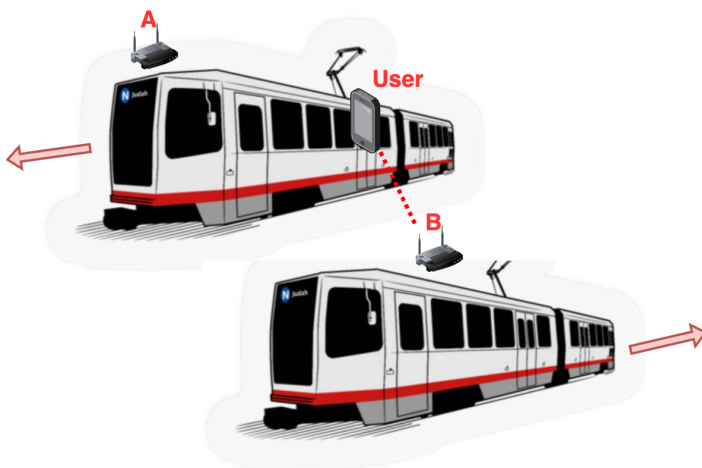


Bachelor's Thesis

Context-aware WiFi Station Association

Abstract

For the association of WiFi stations in IEEE 802.11 (WiFi), the signal strength as well as other parameters such as network load are usually used. However, there are scenarios where such a strategy does not lead to optimal results. Consider the scenario shown with the two parked trains. WiFi serves as the access network here. Assigning users to APs based on context information, i.e. information about in which train a user and the APs are located in, would lead to better performance, as unnecessary handover operations could be avoided.



Goals of the Thesis

The goal of this thesis is to analyze the feasibility and usefulness of utilizing context information like localization (positioning) information for the association process. For this purpose, simulations must be carried out in the network simulator ns3 using the FTM-ns3 library and the performance evaluated. If advantages arise, it should be investigated to what extent the 802.11 protocol needs to be adapted to enable context-dependent association.

Requirements

It will be helpful to have a basic understanding of *Wireless Networks* in general and *IEEE 802.11 Technology* in particular, *Network Simulation and NS3*, and *C++ or Python*. In case you are not familiar with these requirements, you will need to familiarize yourself during the thesis.

Literature

- Zubow, Anatolij, Christos Laskos, and Falko Dressler. "Toward the simulation of WiFi Fine Time measurements in NS3 network simulator." *Computer Communications* 210 (2023): 35-44.