INTELLIGENT TRANSPORTATION SYSTEM

Guided by

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Presentation Outline

- Introduction
- Abstract
- Literature Survey
- Objective
- Block Diagram
- Expected Outcome
- Execution Plan
- References

Introduction

Description

- A Vehicular Ad-Hoc Network (VANET) is the same as a mobile network which is been formed by the moving vehicles as nodes.
- The main goal of V2V communication is to avoid accidents by allowing vehicles in transit to send speed and position data to one another over an ad hoc mesh network.
- VANET architecture is to allow the connection between vehicles or between vehicles and fixed road side units leading to the following three possibilities

V2V,V2I,I2I *V-Vehicle I-Infrastructure

Domain : Wireless Network

Abstract

- Intelligent Transportation System (ITS) research,including its implementation in a real life going through the optimization in order to have the best and accurate results is growing exponentially.
- Analyze the delay and therefore the different characteristic performance of the vehicle to vehicle communication using VANET in Simulation of Urban Mobility (SUMO) and Network Simulator(NS3)
- Vehicular Ad-Hoc Network (VANET) routing protocols will be done using NS3 simulator to select the best protocol for V2V Implementation
- Then the best V2V routing protocol based on the paper's Key Performance Indicators and point of view will be used to compare between existing architectures, other with proposed V2V implementation

Literature Survey

Paper details	Journal details	Methodology	Advantages/ Disadvantages
1.Ahmad Yusri Dak ,Saadiah Yahya , Murizah Kassim (Universiti Teknologi MARA)-https://www.researchgate.net/publication/271302406_A_Literature_Survey_on_Security_Challenges_in_VANETs	A Literature Survey on Security Challenges in VANETs -2012	Vehicle ad-hoc networks (VANETs), mobile ad-hoc networks (MANETs), security, technique.	Advantages:- 1.Integrity 2.Authentication 3.Confidentiality DisAdvantages:- 1.Sending False Information 2. Node Impersonation 3.Non-Repudiation

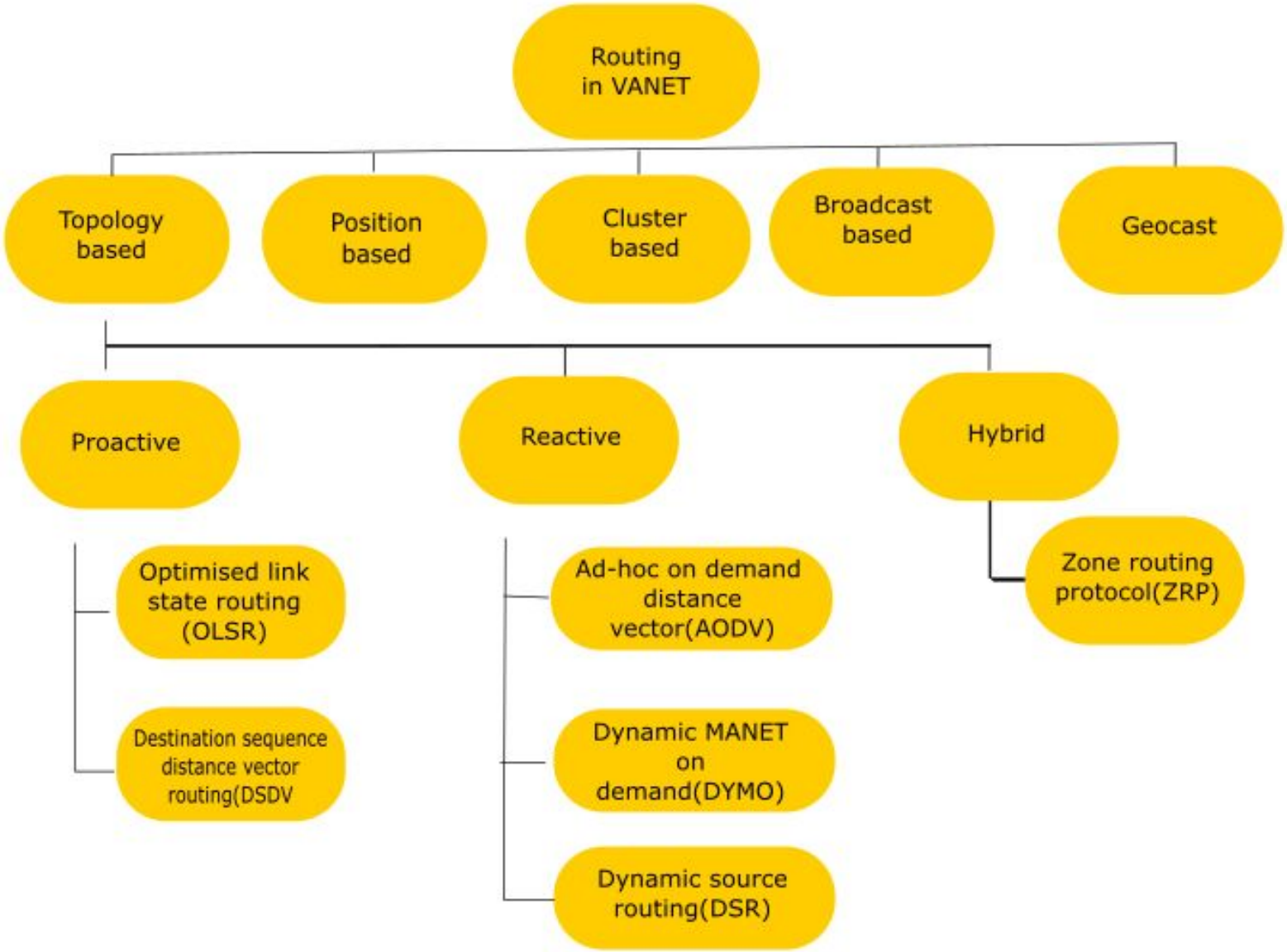
Literature Survey

Paper details	Journal details	Methodology	Advantages/ Disadvantages
Aditya Upadhyay, Manoj Sindhwani (Lovely Professional University)-https://www.researchgate.net/publication/293633002_Literature_Survey_on_issues_and_challenges_of_clustering_in_VANET	Literature Survey on issues and challenges of clustering in VANET -2015	VANET, clustering, clustering issues, clustering based routing protocols, Issues and challenges of clustering in VANET.	Advantages:- 1.Collision Avoidance of Vehicles 2.Wireless Communication Scheme 3.Peer to peer application system DisAdvantages:- 1.Collision and Congestion 2.Impact of Environment 3.Social and Economic Challenges

Objective

- The main objective of this project is to analyze the delay and therefore the different characteristic performance of the vehicle to vehicle communication using VANET in Simulation of Urban Mobility (SUMO) and Network Simulator(NS3)
- Intelligent Transportation System (ITS) targets to provide innovative services relating to different modes of transport and traffic management .
- Message deliveries using different routing protocols Optimized Link State Routing(OLSR)Ad-hoc On-Demand Distance Vector (AODC) Destination Sequenced Distance Vector (DSDV).

Routing in VANET



Hardware / Software Details

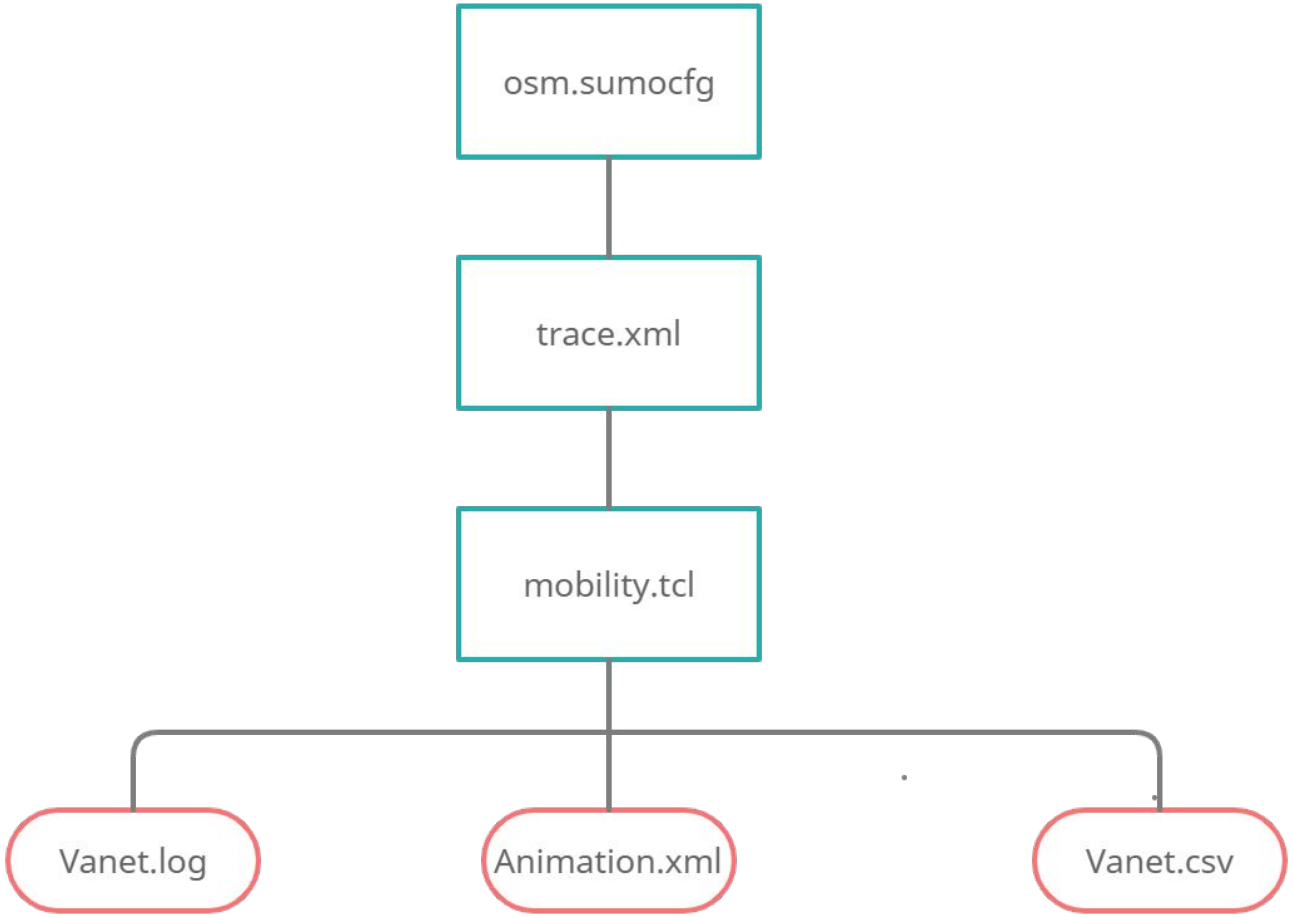
Hardware

- Memory (RAM)> 4GB
- CPU > i3
- Graphics > 2GB
- Disk >8GB

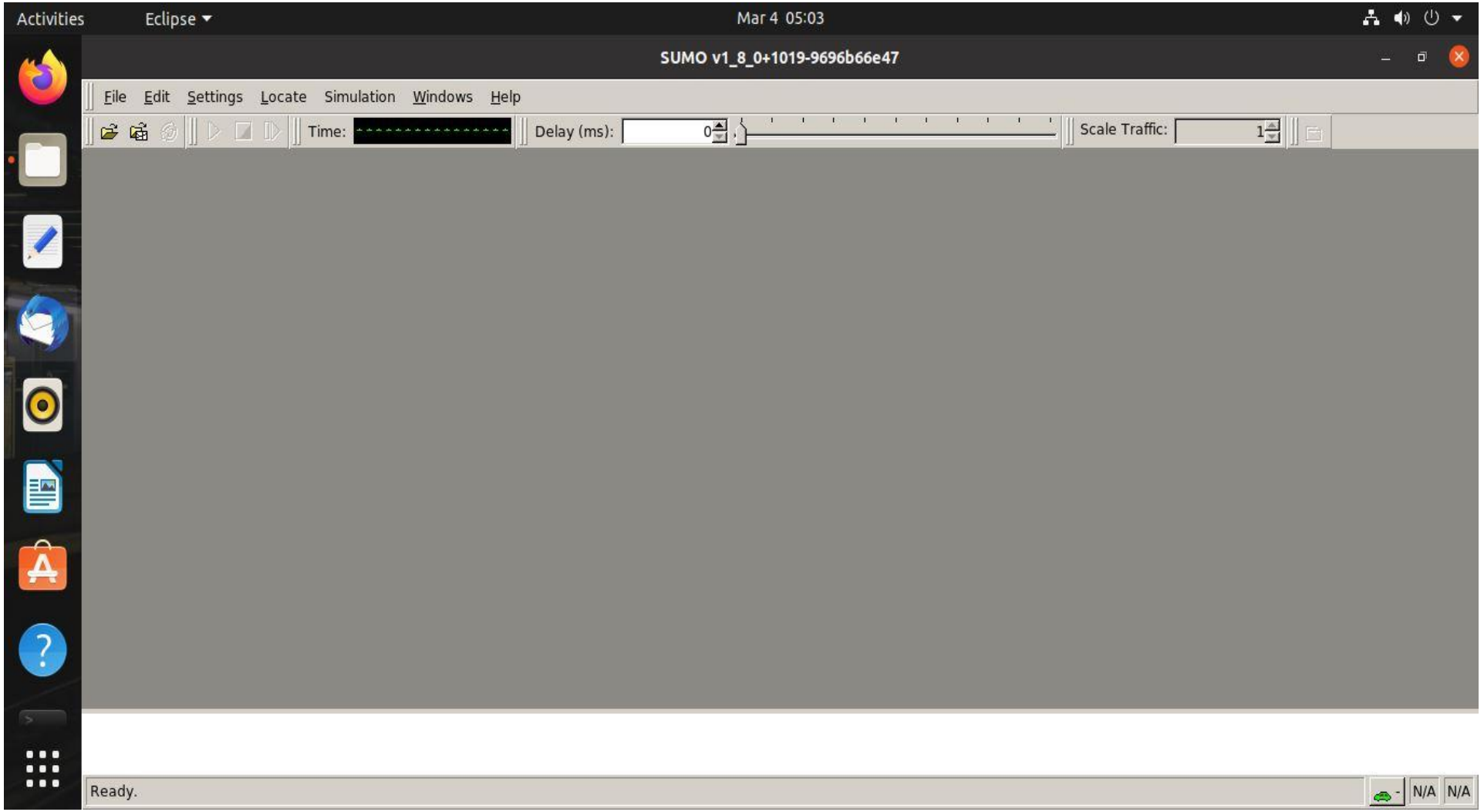
Software

- VMware Workstation 16 Player
- Ubuntu 64-bit
- Linux-5.8.0-41
- SUMO-1.8.0
- Ns3(Network Simulator)

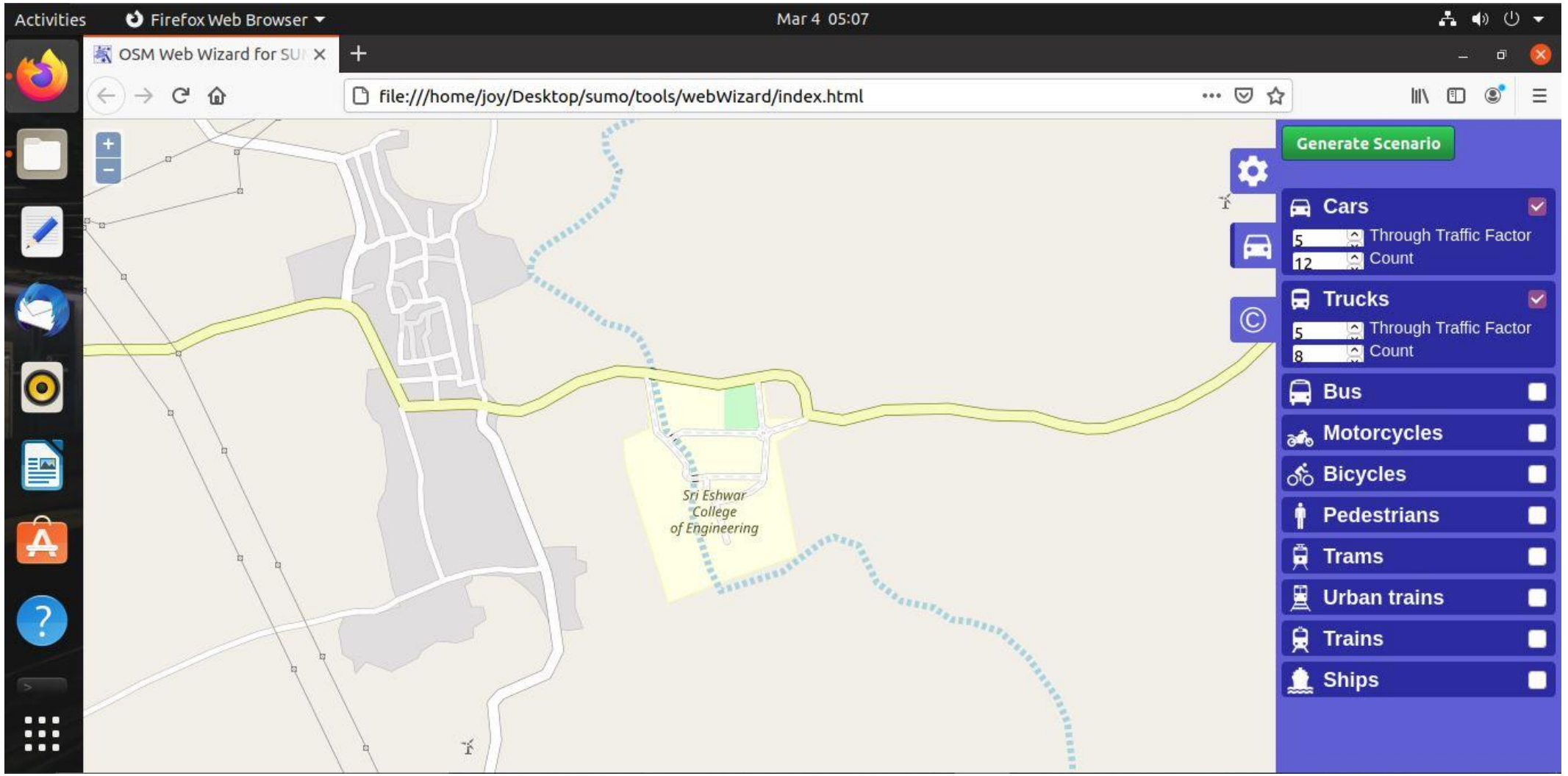
Block Diagram:-



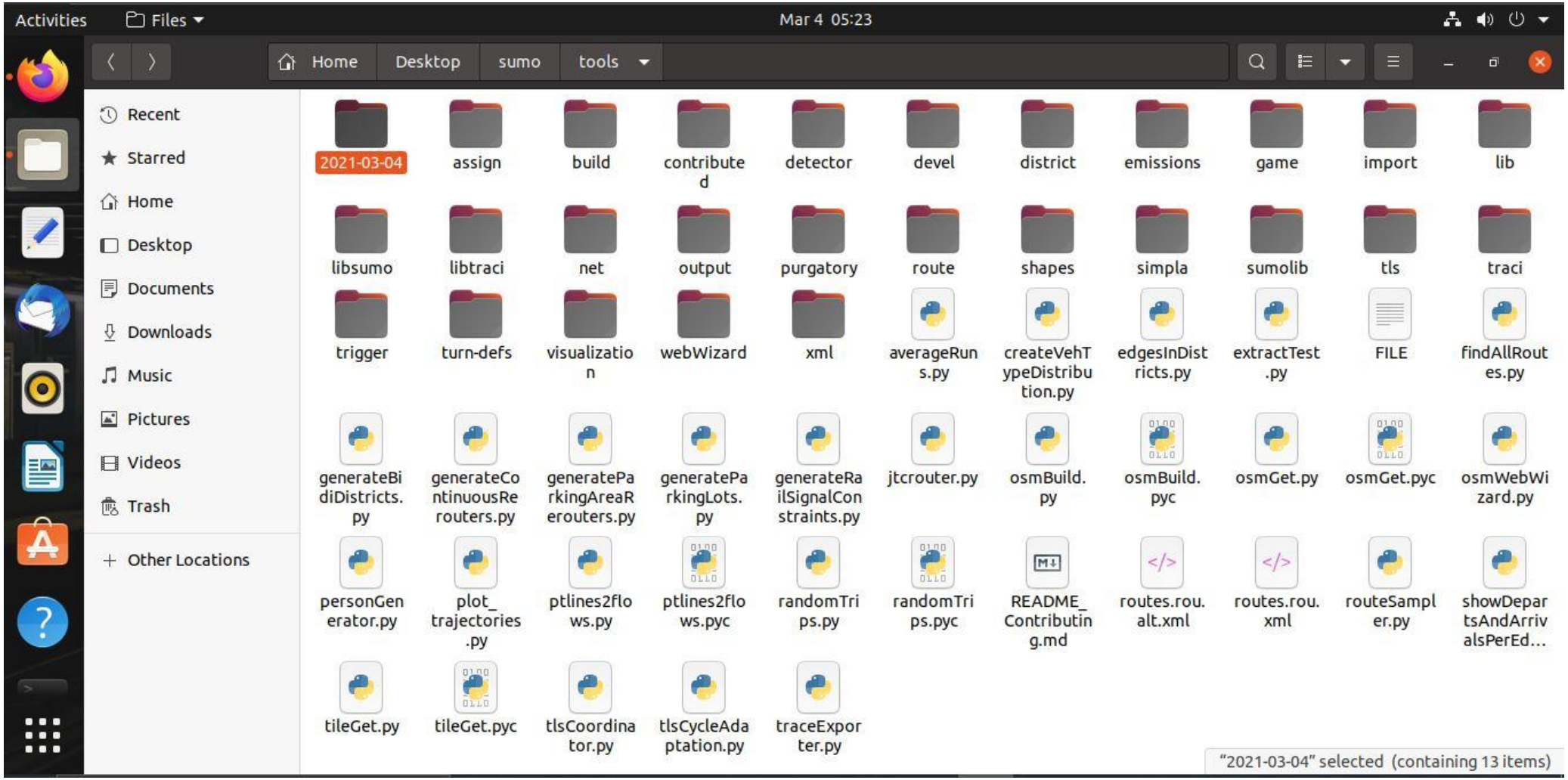
Sumo Software for Road Map Modelling:



RoadMap And Vehicle Selection:



Sumo Output:


Activities
Files
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Home
Desktop
sumo
tools
Recent
Starred
Home
Desktop
Documents
Downloads
Music
Pictures
Videos
Trash
Other Locations
2021-03-04
assign
build
contributed
detector
devel
district
emissions
game
import
lib
libsumo
libtraci
net
output
purgatory
route
shapes
simpla
sumolib
tls
traci
trigger
turn-defs
visualization
webWizard
xml
averageRuns.py
createVehTypeDistribution.py
edgesInDistricts.py
extractTest.py
FILE
findAllRoutes.py
generateBidiDistricts.py
generateContinuousRerouters.py
generateParkingAreaRerouters.py
generateParkingLots.py
generateRailSignalConstraints.py
jtcrouter.py
osmBuild.py
osmBuild.pyc
osmGet.py
osmGet.pyc
osmWebWizard.py
personGenerator.py
plot_trajectories.py
ptlines2flows.py
ptlines2flows.pyc
randomTrips.py
randomTrips.pyc
README_Contributing.md
routes.rou.alt.xml
routes.rou.xml
routeSampler.py
showDepartsAndArrivalsPerEd...
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tileGet.pyc
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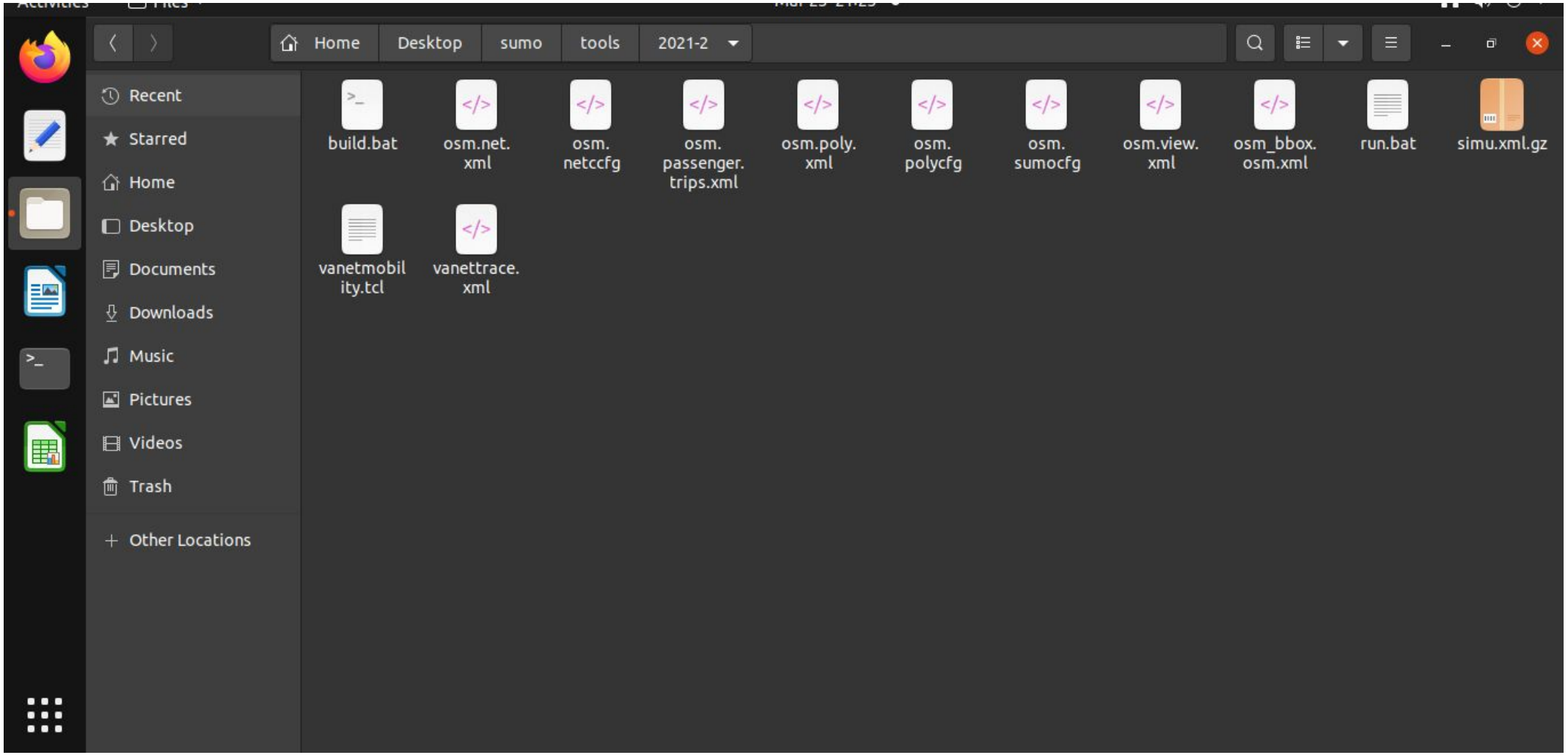
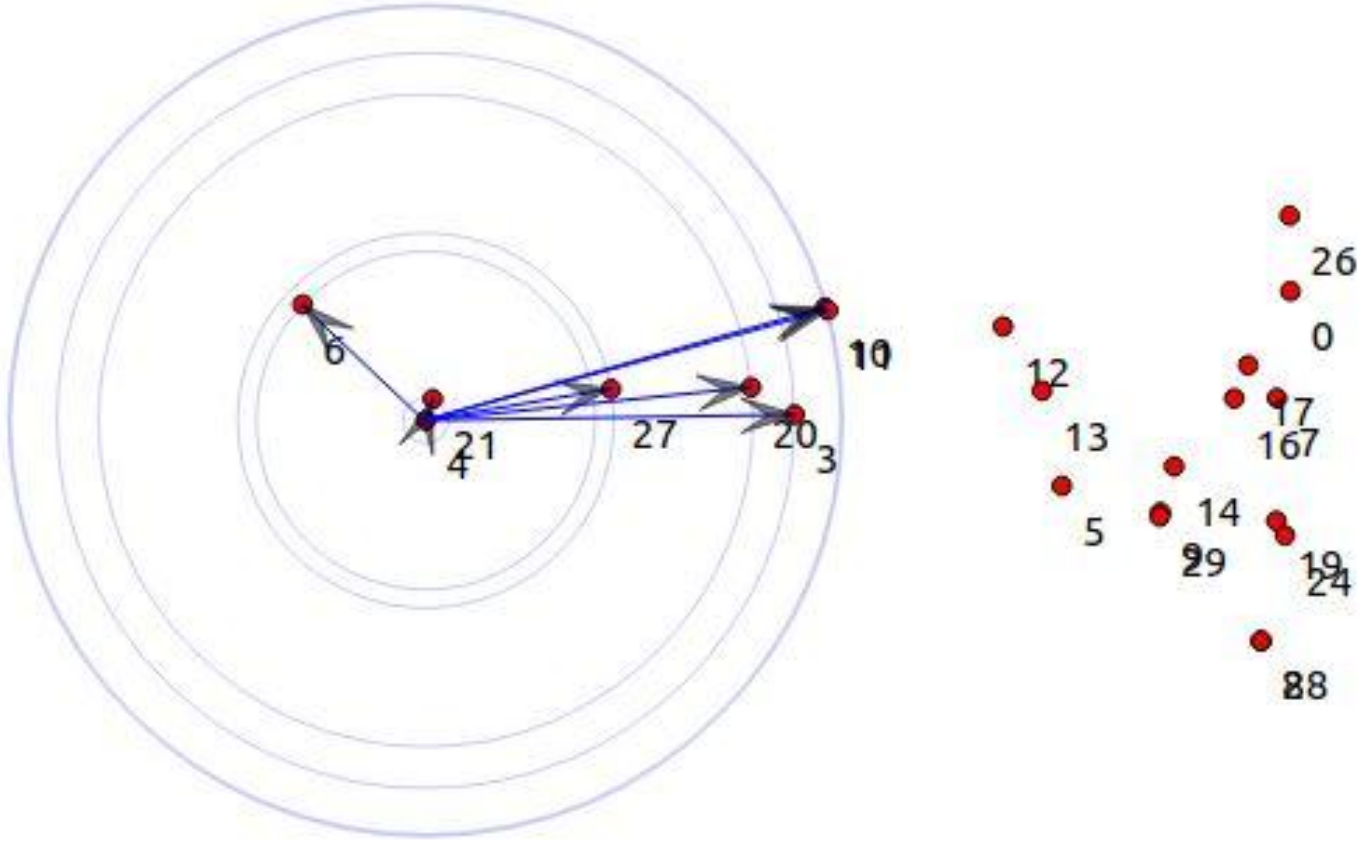
File Translation



NS3(Network Simulator):



Execution Plan

- In the first Phase Installation of the software NS3(Network Simulator),Sumo(Simulation of Urban MObility),RoadMap Implemtaion
- In the Second phase, two scenarios were used(1st one with 20 vehicles and the 2nd one with 40 vehicles) with four different routing protocols (AODV, DSR, GRP, OLSR).
- In the third phase, the selected VANET routing protocol “AODV”(Ad-hoc On-demand Distance Vector) will be used to compare between the V2V implementation (1st one with 20 vehicles and the 2nd one with 40 vehicles), the comparison is based on six KPIs(VANET Delay, VANET Throughput, VANET Retransmission Attempts, VANET Dropped Data, VANET Load and VANET Traffic Received)..

References

1. Balapgol, S., & Deshmukh, P. K. (2015, July). Broadcast protocol for V2V and V2RSU in VANET. *International Journal of Advanced Research in Computer and Communication Engineering, 4*(7). [Google Scholar]
2. Coutinho, B. V., Wille, E. C., & Del Monego, H. I. (2015, January). Performance of routing protocols for VANETs: A realistic analysis format. In *Proceedings of the 9th International Conference on Ubiquitous Information Management and Communication* (p. 1). ACM. [Google Scholar]
3. Da Cunha, F. D., Boukerche, A., Villas, L., Viana, A. C., & Loureiro, A. A. (2015, September). Data communication in VANETs: A survey, challenges and applications. [Google Scholar]

Thank you!