Archangel Protocol for Pedestrian to Vehicle Communication via 5G Networks

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Overview

Introduction

- Autonomous driving has a growing interest
  - More self-driving cars
  - Less human control
- Pedestrians are the potential victims
  - Exposed to traffic dangers
  - No protection
- Smartphones
  - Share location
  - Increase safety
- Huge amount of data
  - 5G networks

State of the art

- Lorem ipsum dolor sit amet, consectetur adipiscing elit
- Aliquam blandit faucibus nisi, sit amet dapibus enim tempus eu
- Nulla commodo, erat quis gravida posuere, elit lacus lobortis est, quis porttitor odio mauris at libero
- Nam cursus est eget velit posuere pellentesque
- Vestibulum faucibus velit a augue condimentum quis convallis nulla gravida

The Archangel protocol

Block 1

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Block 2

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Block 3

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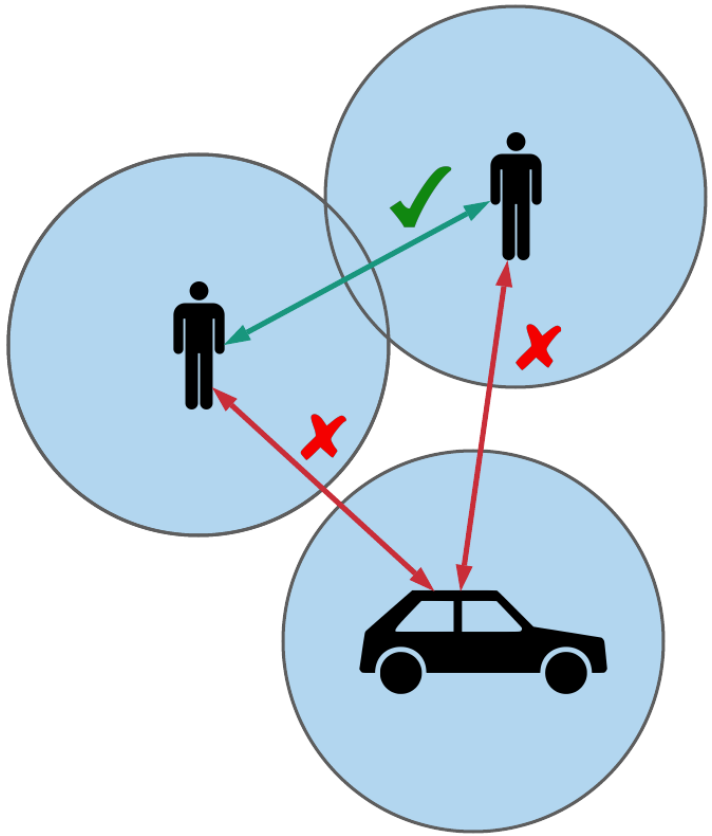
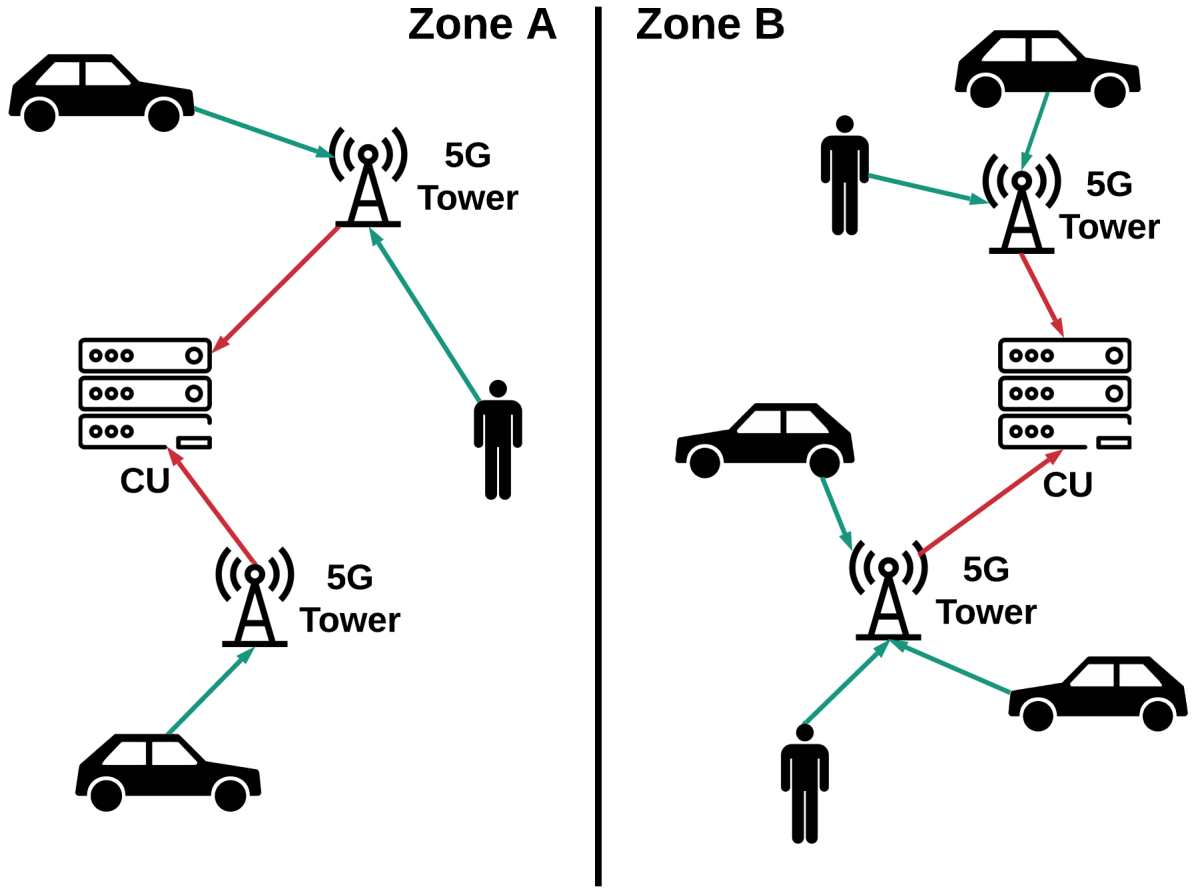
Computational units

- Endpoints cannot process large amount of data
- Border coverage is needed
- Centralized points
- High computing capacity
- Computations within critical time constraints
- Precision



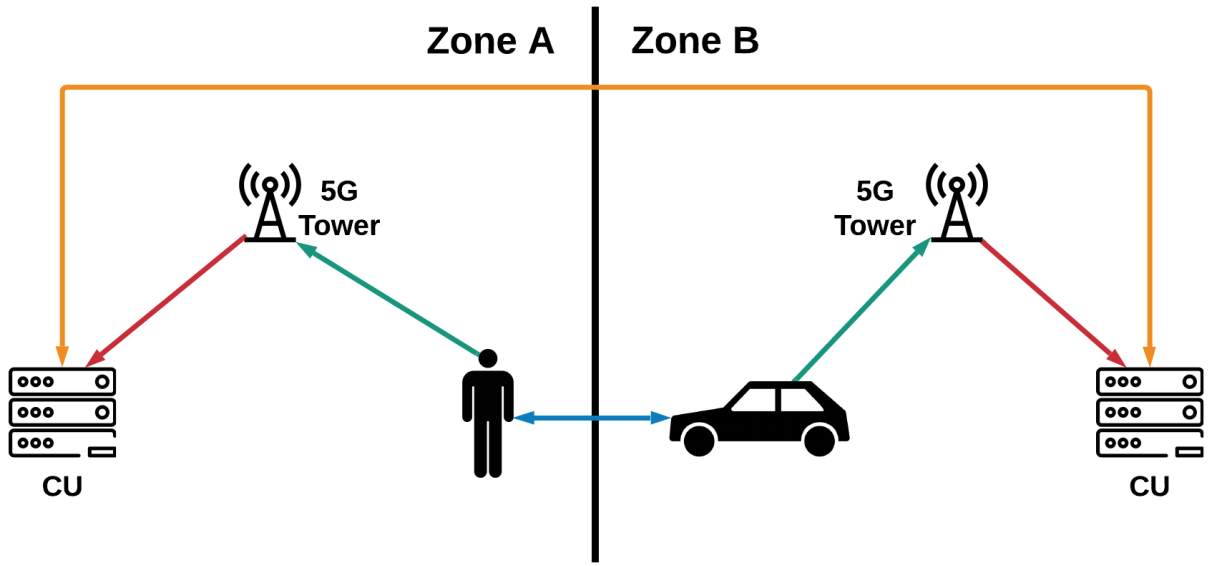
Communication

- Node $\rightarrow$ 5G Tower $\rightarrow$ Computational unit
- Area described by a given computational unit is a zone



Edge case

- Pedestrian and a car in a separate computational zone
- The car's computational unit needs to know the pedestrian's data
- Which of the two CUs should calculate the data for the car?
  1. Optimal case → The CU which is in the zone of the car
  2. Network round trip to save time in case when the car's CU is already critically loaded

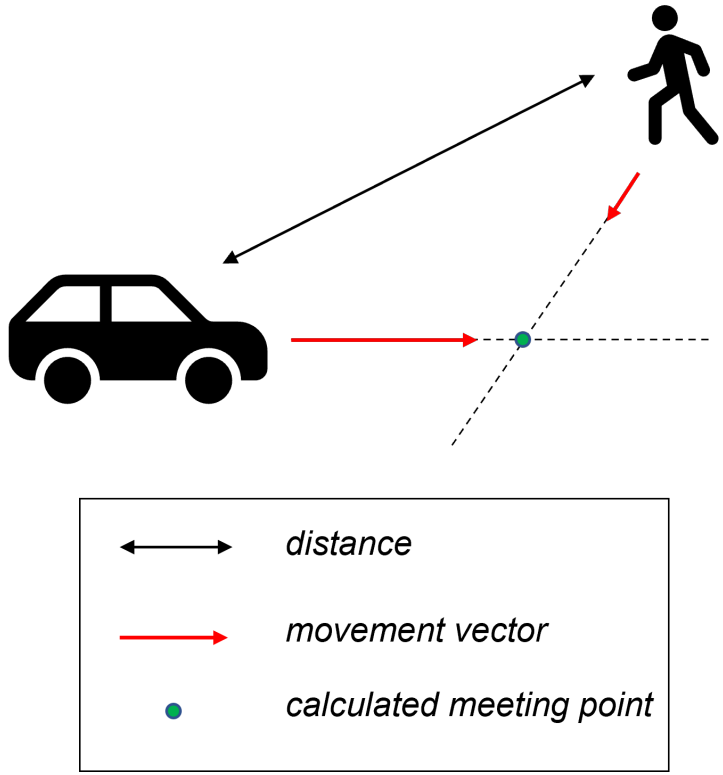


Scoring system

- Analysis of the situation
- Define the order of urgency between the notifications

Calculations - key points

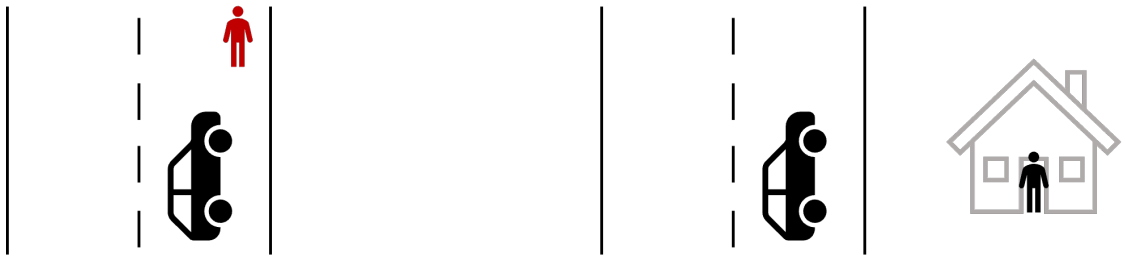
- movement
  - speed
  - direction
- position



Scoring system

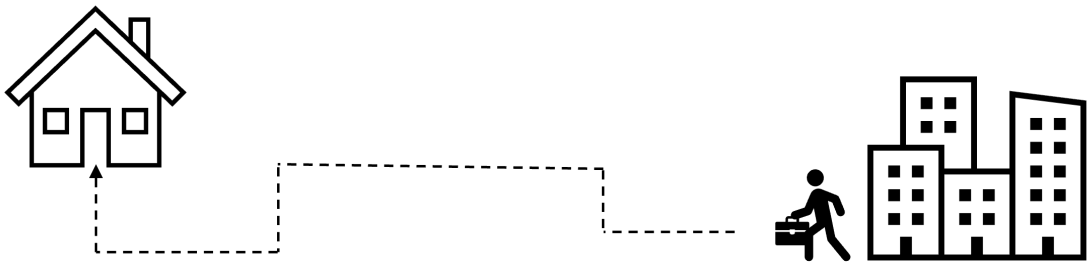
Environment

If data is available about the environment, it can increase or decrease the score.



Predictions

The last part of the score calculation is to assess the possibility of certain routes and to predict movements.



Package structure

Theorem (Mass–energy equivalence)

$E = mc^2$

Figure

Uncomment the code on this slide to include your own image from the same directory as the template .TeX file.

Citation

An example of the `\cite` command to cite within the presentation:

This statement requires citation [Smith, 2012].

References

John Smith (2012)

Title of the publication

Journal Name 12(3), 45 – 678.

The End