Project 1 – Vehicular network: car sensing

A vehicular system is composed of N vehicles that move randomly within a 2D floorplan of size $L \times H$, according to a waypoint model. A waypoint is defined by a pair of coordinates *(x,y)* and a speed *s*. The coordinates *x*, *y* are random variables to be defined later. Vehicles move between waypoints **a** and **b** at the constant speed selected together with **b**. As soon as a vehicle reaches a waypoint, it selects a new one and moves towards it.

Vehicles are equipped with a wireless interface and can communicate with other vehicles falling within their transmission range *M*. Every *T* seconds each vehicle checks how many cars are within its transmission range. The relationship between T and M is expressed as $T = \propto \times M^2$ due to power constraints. α is the efficiency of the wireless interface and can assume values between 0 and 1.

Evaluate at least the overall rate of vehicles sensed per second for various values of M and α.

At least the following scenario has to be evaluated:

- uniform distribution of *x* and *y*;

In all cases, it is up to the team to calibrate the scenarios so that meaningful results are obtained.

Project deliverables:

a) Documentation (according to the standards set during the lectures)
b) Simulator code
c) Presentation (up to 10 slides maximum)