



UNIVERSITÀ DEGLI STUDI DI MILANO

Exam: organization and assignments

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Course structure and examination dates

The GDM course is split in two parts:

- Part 1: lessons in [1,8] on basic topics (lectures and practices)
From lecture *lec1_tour* to *lec8_spatial indexing*
- Part 2: lessons in [9,12] on advanced topics (lectures and practices)
From *lect9_Movement* to *lec12_Spatial data analysis*

The exam can be taken at different sessions during the academic year (the exam sessions are called «appelli» in italian).

- Exam sessions in the Winter season:
January 25th
February 17th

The examination in practice

- First, you have to register for the exam session on the Unimi Web site. Take care of the deadlines
- Remote exams (!). The session is organized as a Zoom session. The link will be sent to the registered students a few days before the examination date. Students not located in Italy can ask to move the examination to a more convenient time
- The examination consists of two phases:
 - (a) Discussion on the assignment ('project')
 - Present the project using slides (from 7 to 10 slides) and show a demo of how the system works.
 - Repond to queries on the project and the underlying concepts presented in related lessons (typically in part 2 of the course)
 - (b) Oral test
 - Respond to queries concerning part 1 of the course
- Exam marks: 18/30 is sufficient to pass the exam; 30/30 is for very good examinations; 30 e lode (laude) for excellence.

Assignment: Project 2020

Two alternative projects, you shall select one of the two.

Project 1: The problem is to determine possible stops (regions where the user stays for some time) along a trajectory. For example, pedestrian can stop at shops or bus stations.

REQUESTS:

1.1 Trajectory data acquisition. One or more trajectories can be acquired either directly using a GPS points logger or accessing one of the trajectories datasets publicly available, such as GEOLIFE (by Microsoft Asia). There should be visual evidence that there is at least one stop in the selected trajectory

1.2 The student shall implement the *StayPoint Detection* algorithm presented at the end of the course and apply the technique to the analysis of the trajectory. For the implementation, any programming language /software environment can be used

[This is the reference to the paper: Y. Ye et al. "Mining Individual Life Pattern Based on Location History", IEEE MDM 2009]

Assignment: Project 2020

Project 2: Consider the file PEOPLE available on Ariel. It includes 50+ trajectories of individuals moving in a shopping mall (a map is reported in the next slide). The data is in cvs format. Import the data in PostGIS and set a projected coordinate system with meter as measure unit (the coordinates are defined locally as cartesian coordinates).

The record fields have the following meaning:

id - identifier of the point

uid - user or trajectory identifier

tempo - timestamp expressed in milliseconds

x, y - coordinates in meters

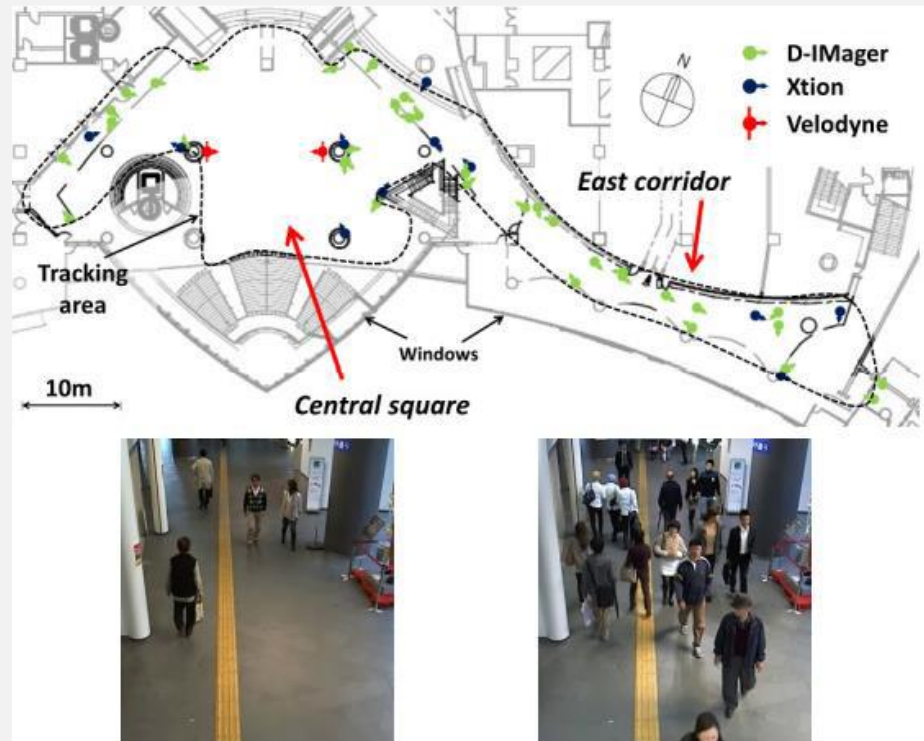
REQUESTS:

2.1 Determine and show the groups of people (groups of at least 2 persons) moving in close proximity (distance < 1 m) for some time

2.2 Determine the number of instants every pair of persons of the group are in proximity and show visually where it happens

2.3 Measure the average speed of the group. Define first a measure of average speed for the group.

(cont)



Data shall be stored in PostGIS.
Processing can be performed
using any environment

A map of the shopping mall

Project 2020: what you have to do before the examination

1. Select one the two projects
2. Analyze the problem: understand the data, introduce missing assumptions if needed, understand the requirements, design a solution
3. Implement the solution. Feel free to select the development platform, feel free to be creative!
4. Test the solution
5. Document the project: write a document reporting the problem analysis, the implementation and the results. Use maps to illustrate the results. No other specific indication is given, student are free to decide how to present the work. Send the report in pdf to maria.damiani@unimi.it and fatme.hachem@unimi.it two days before
6. Prepare the material to present the work: slides and demo

A project can be presented by single students or by groups of at maximum 2 students. In the latter case, the final report can be unique. In project 1, the data used by one student/group cannot be shared.



For any question

A mail to both: maria.damiani@unimi.it and fatme.hachem@unimi.it

good luck!!