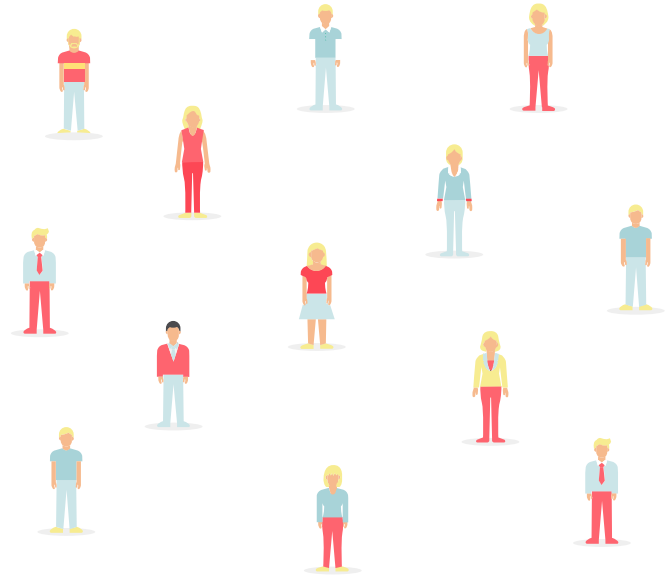
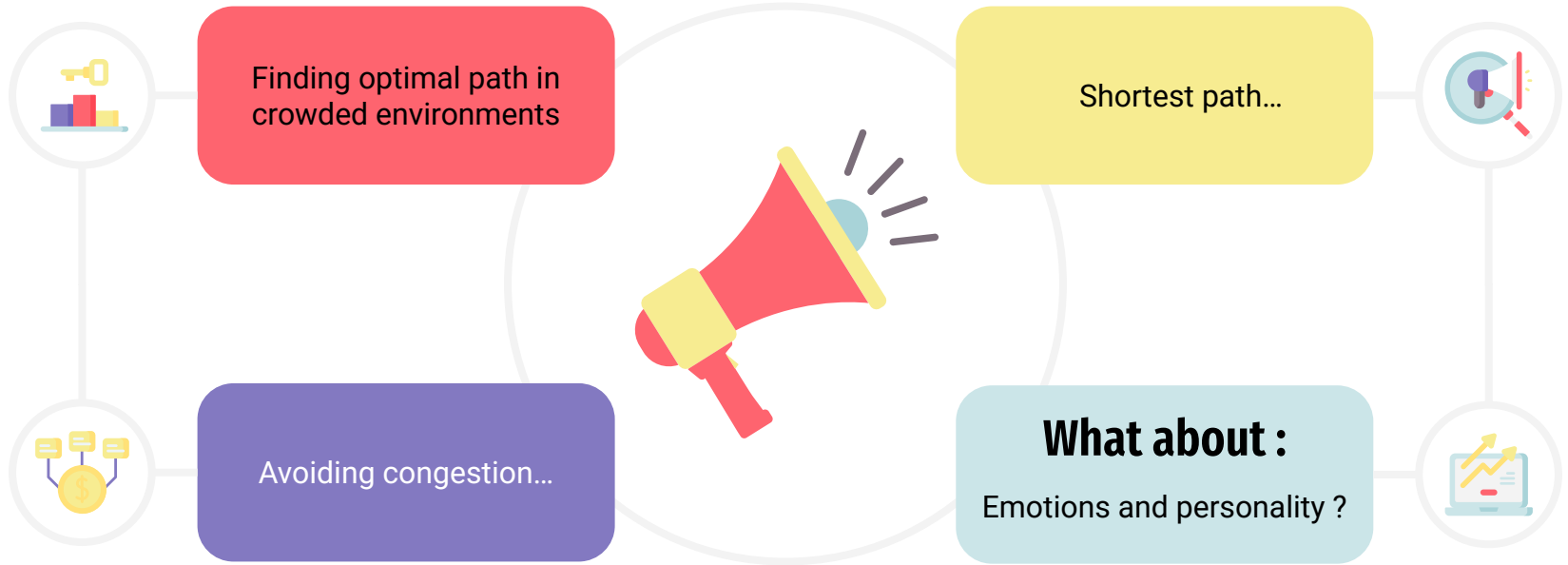


Crowd modelling

Luc Brun, Manon Tregon, Cécile Luc, Alexis Mourier



Crowd path planning. What is it ?



Why should it interest anyone ?

Public safety

Evacuation
planning

Ex : crowd
movement (concert)

human dynamics & real world
nuances

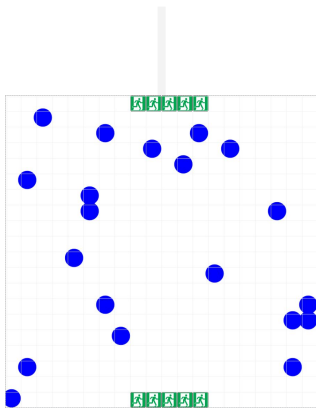


→ Emotion Contagion & Fuzzy Logic

3 mains stages

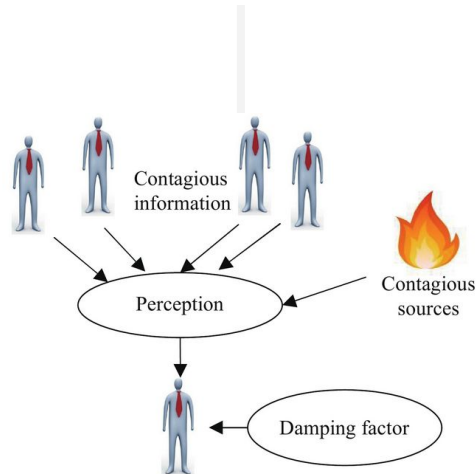
Crowd path planning model

Create the initial model in which agents among a crowd have to reach an exit.



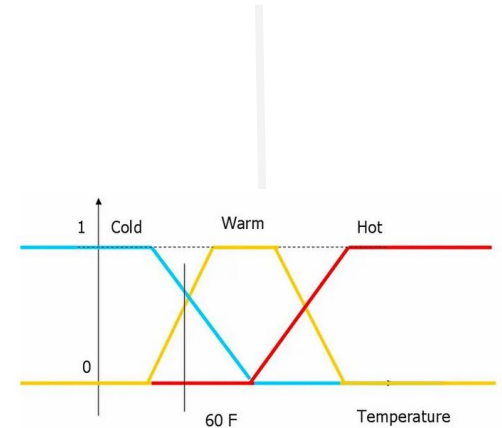
Emotion Contagion

Improve the previous basic model by adding personalities to agents and by creating an emotion contagion phenomena.



Fuzzy logic rules

Make the model even more realistic by translating "crisps" logic rules into fuzzy ones.



Achievements



Successful implementation of the crowd path planning model through the 3 previous stages.



Implementation of a basic but sufficient visualisation model.



Realisation of deep tests using different starting configurations (agent locations, personalities, exits, etc ...).

Key Challenges

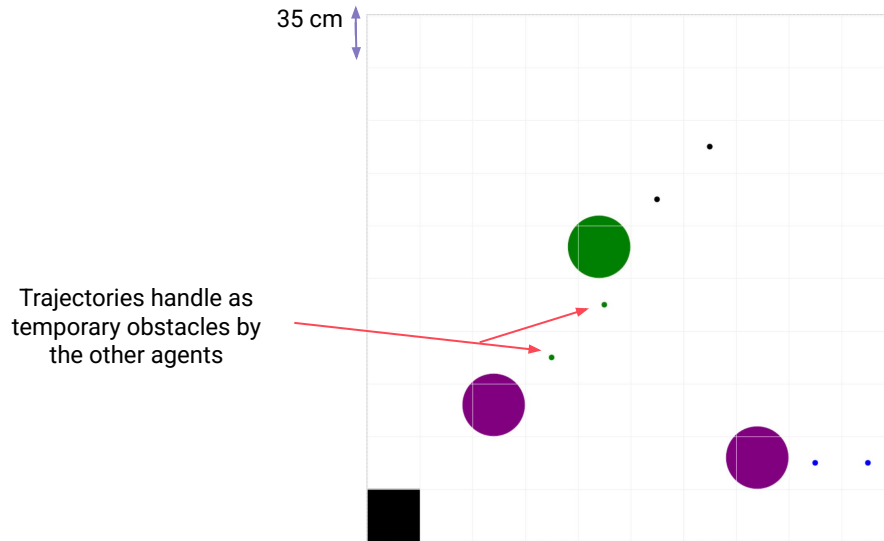
1

Designing the core of our crowd dynamics Model

2

Assessing the Performance of our Model

Designing the core of our crowd dynamics Model



The choices we made :

- Grid Composed of 35 cm x 35 cm Cells
- Agents move asynchronously at each step, marking their path as a temporary obstacle to prevent collisions.
- Speed is represented as the maximum step size (in one direction) the agent can make in a single simulation step (between 1 and 3)

How to assess the performance of our Model?

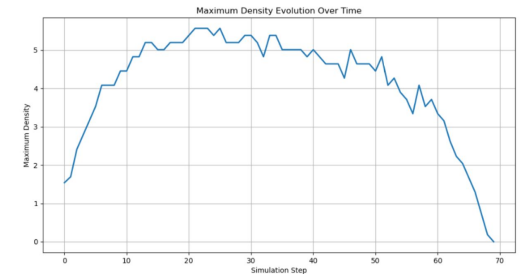
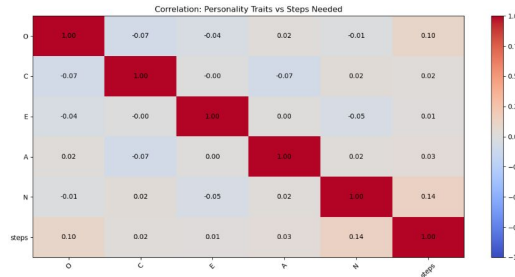
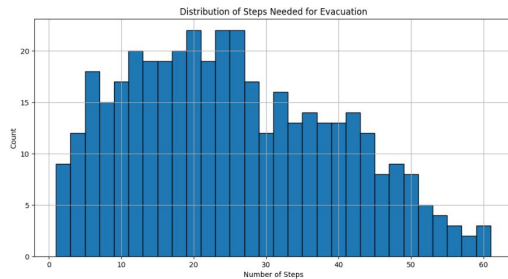
Our approach

Varying model parameters using different detrics to see If we observe any interpretable differences

Here is the metrics we used :

- Maximum density over time
- Personality trait and number of step correlation matrix
- Distribution of step needed for evacuation
- Average step needed by agent with the same dominant trait
- Evacuation timeline (Proportion of Evacuated agents across time)

Examples of metrics/graphs we computed



Organization

What would you do differently, should you start all over again?

Deadlines

- Planned schedule
- Staying on track

Regular Meetings

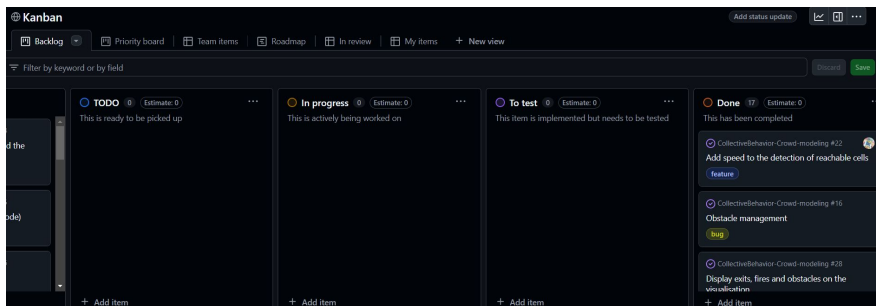
- In person
- Online
- Working on whiteboard

Task Distribution

- Kanban
- Tailored to the tastes, skills, and timetables of group members
- Even distribution

Tools

- GitHub:
README
Specific branch -> to_test -> main
- Discord



Thanks for your attention :)