SMART STATIONS IN SMART CITIES
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PASSENGER MODELLING: STATUS AND USE FOR RAIL STATIONS DESIGN

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Session 2a: SMART DESIGN

UNDER THE HIGH PATRONAGE OF

ORGANISERS
1. Introduction: the use of simulation for Rail Stations
3. Example of Austerlitz Rail Station in Paris
5. Research challenges and status
6. Conclusion
INTRODUCTION

Conception of a rail Station:

- Functional analysis
- Design with interactions between: Urbanists, Architects, Civil Engineers, Transport Engineers.
- Scenario evaluation:
  - Architectural and constructive aspects
  - Functional aspects: Dynamic modelling of flows to validate the design of scenarios (inside and outside).
Scope of dynamic simulations

- Inside: Passenger flows
- Outside: Passengers and interactions with car traffic, buses, tram, cyclists and taxis (urban and infrastructure's design)
Example of a Rail Station: Paris Austerlitz

- 21,3 Mio passengers per year
- SNCF Surface Station with RER and metro underground stations

Flux prévisionnel 2025 :
24 000 voyageurs HPM
(+ 10 000 par rapport à 2008 : +71%)
Validation of Rail Station design

- Passenger flows at pick hour (in operation and safety)
Scenario assessment:

Passenger flows inside Station (23'000 passenger at pick hour H2030)
Traffic, public transport and Interactions with traffic
Scenario assessment:
- Traffic density
- Travel times and other statistics
Research Challenges

- Study pedestrian dynamics
- Understand pedestrian behavior and interactions
- Understand how microscopic interactions influence traffic
Pedestrian traffic in railway stations

- Fluidify pedestrian flows:
  - Optimal circulation conditions
  - Identifying pinch points

- Study the interaction between different elements of the infrastructure

- Manage pedestrian flow to optimize train traffic operations
Micro v.s. Macro modelling
Joint modelling

- Turnstiles
- Escalator 1
- Stairs 1
- Escalator 2
- Stairs 2
- Restaurant
CONCLUSION

- Dynamic simulation is an efficient tool for:
  - Design & conception
  - Assessment of scenarios
  - Inside rail Station, and interactions related to outdoor Station's perimeter: interactions pedestrians – vehicles or crowd behaviour).

- Ongoing research to improve interactions within modelling process.
THANK YOU
GRACIAS

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