

Simulation model for spatial planning

Concourse
Shopping mall
Plaza

- public place
- for multipurpose use

How architects work out plans???

Taste Sense

Safety
Convenience
Amenity

Amusement

Cost
Maintenance

Marketing
strategy

Estimates of prospect user's
-behavior
-Attributes

e.g.

- How many user's are expected to come?
- Around what age are they?
- They may get tired after 40 minute-walk
- They will spend 2 hours here on average
- Most of them leave from the same gate as the one they used when they enter

Coordinate all needs, restriction and design concepts

suggestion

assessment

Drafts / proposals

The final plan / design

Simulation model for spatial planning

Concourse
Shopping mall
Plaza

- public place
- for multipurpose use

How architects work out

Taste
Sense

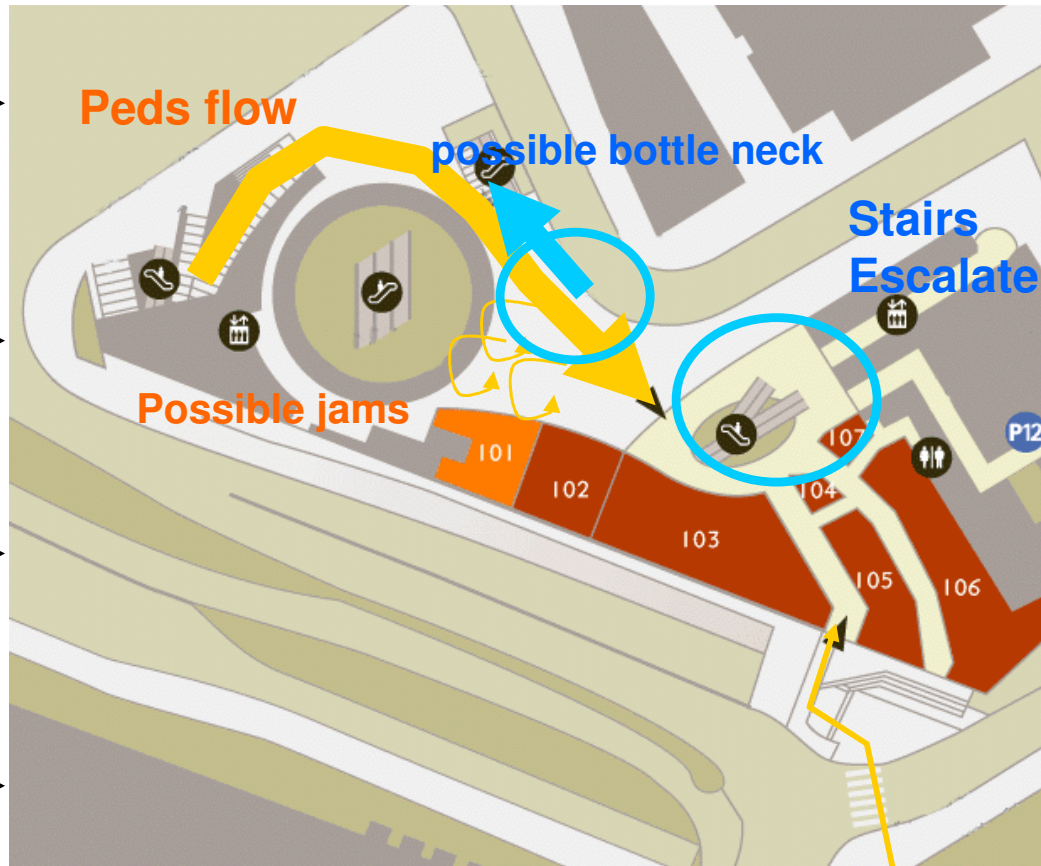
Assumptions

Safety
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Amusement

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Maintenance

Marketing
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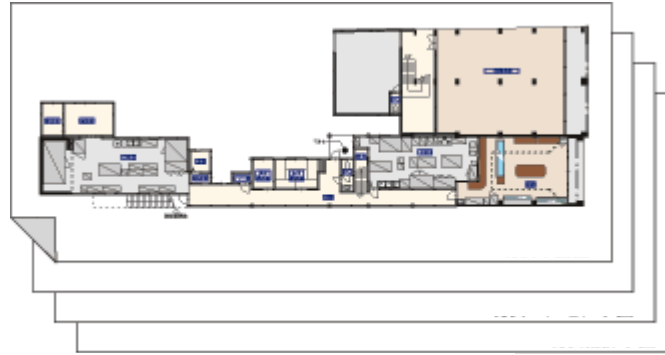


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Drafts / proposals

The final plan / design

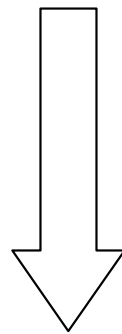
Know-Hows



- **Observation**
- **Analysis on successful plans**
- **Ergonomics**

Design pattern

e.g. Width of corridor
How large the area should be
to have a seating capacity of 1000

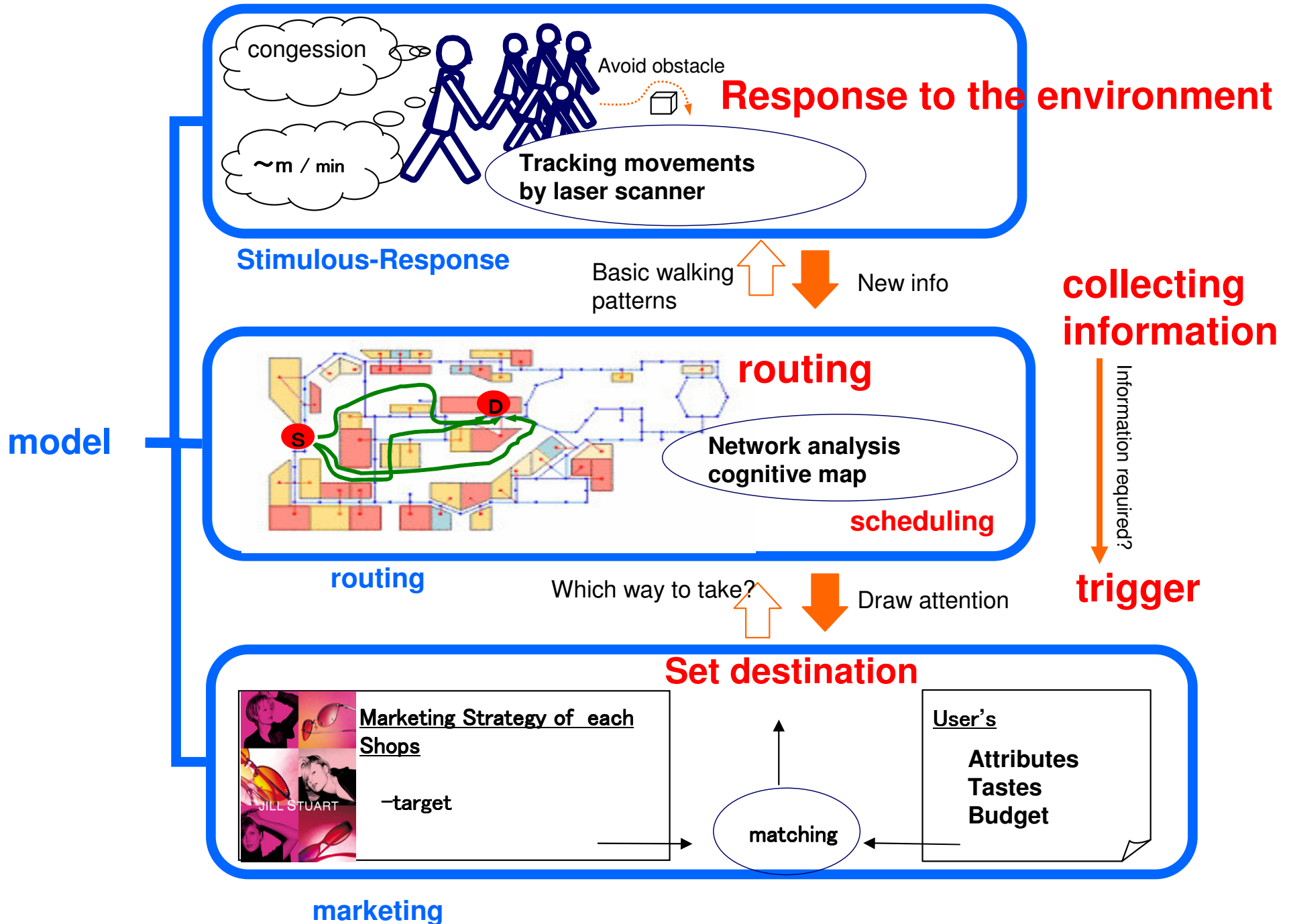


It can't deal with
MOVEMENTS

Behavior model

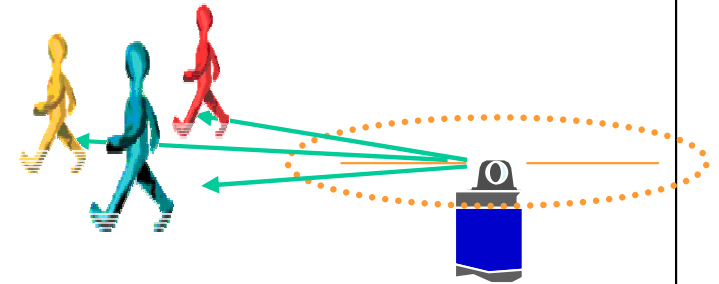
What's the difference in user's movements
between plan A and plan B?

3 levels of pedestrian's behavior



Surveys

Concourse of railroad stations



•Laser scanner

Each pedestrian's trajectory

Level 1

Level 2

Level 3

Shopping malls



Attributes
Tastes

- Response to new info
- Relationship between his/her taste and destinations

Influential factors on routing

Marketing strategy of shops

image, segmentation of the targets

e.g. Elegant
Sophisticated

e.g. Women
30'S



Profile & preferences

Questionnaire

gender

age

magazine

brand



matching

Prediction of possible destinations

Stated preference of each shop

Not my taste

Very fond of it

5 4 3 2 1

Preference survey

Correlation analysis

Any patterns or relations?

Events

Changes of shops

External info

Routes that shoppers took (Observed preference)

× 3 times

Survey on migration behavior

Any influence on behavior?

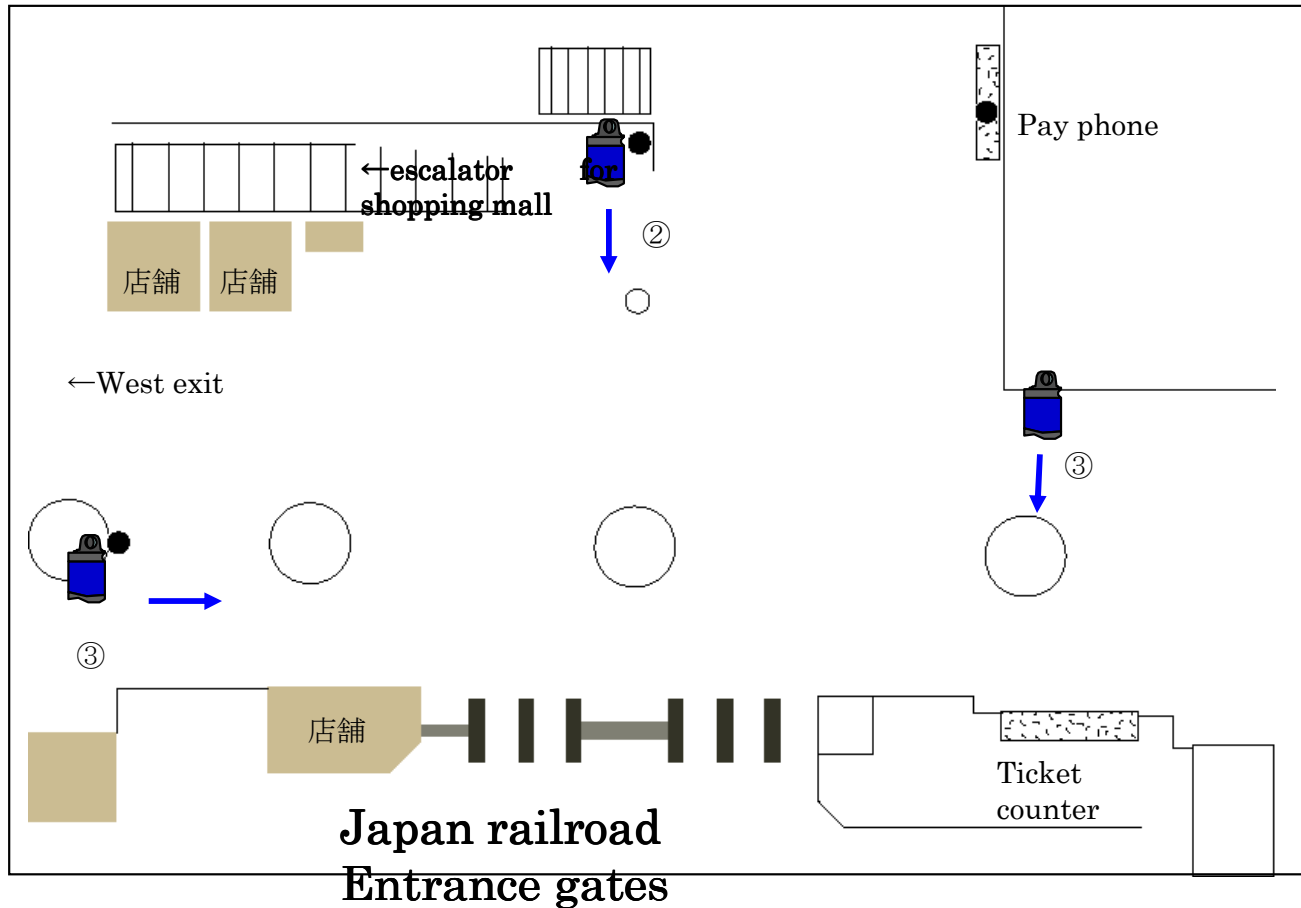
Impressions on the shops they visited

Interviews

Survey on pedestrian movement in a railroad station

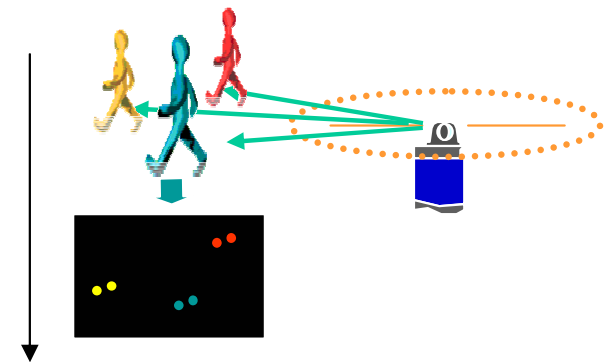
■ survey

2003/02/21(fri) 5:00 - 2003/02/22(Sat) 25:00



Laser scanner

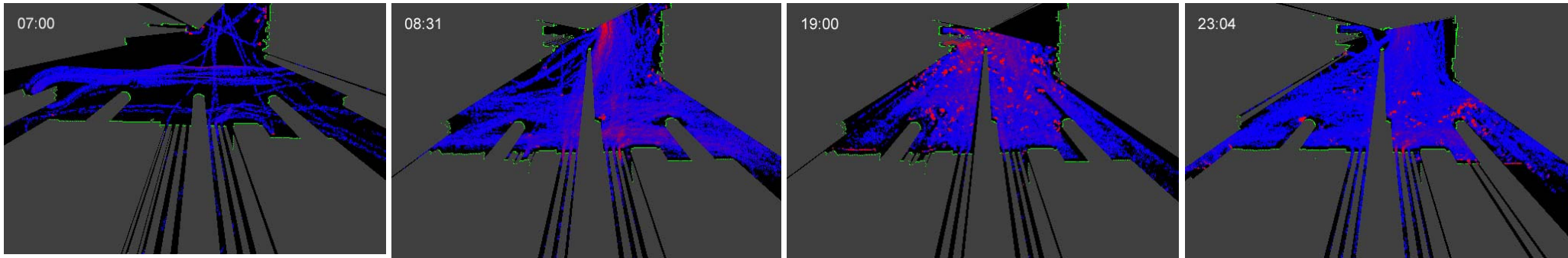
LD-A *Maker:* IBEO Lasertechnik, SICK 291
(10Hz、1080 points/270°、最大到達距離 70m)



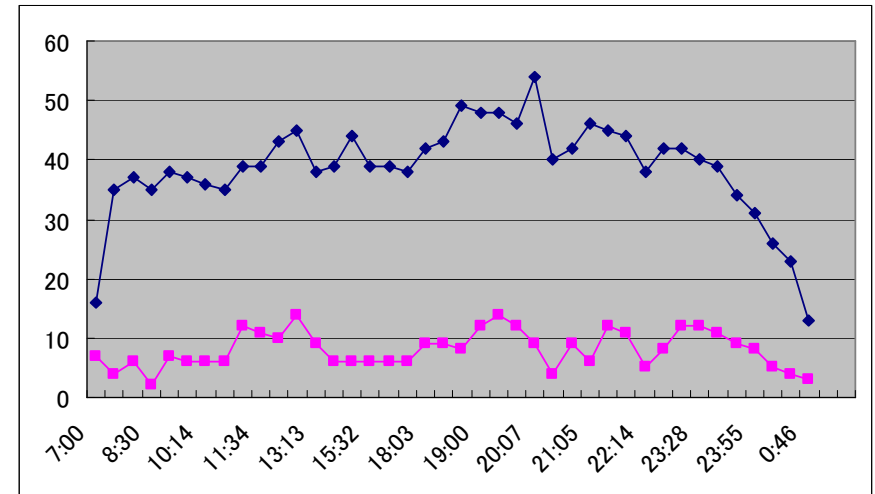
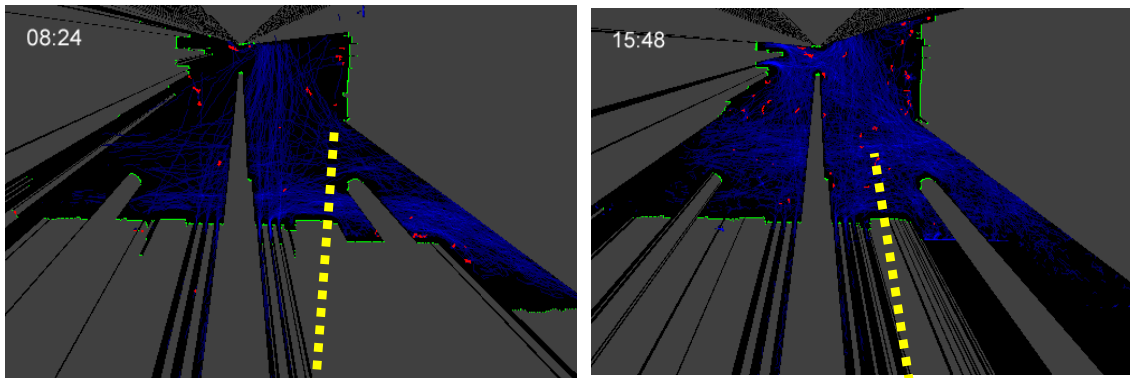
Routes = consecutive series of coordinates(ID, t, x, y)

Analysis on basic walking patterns

Circulation diagram

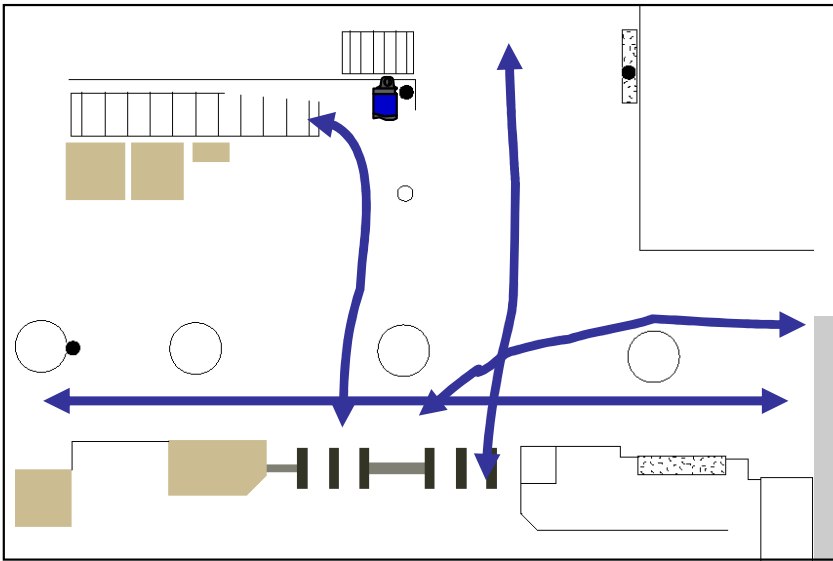


Time series behavior of peds who stay at the same place more than 5 minutes



Against walls → center of concourse

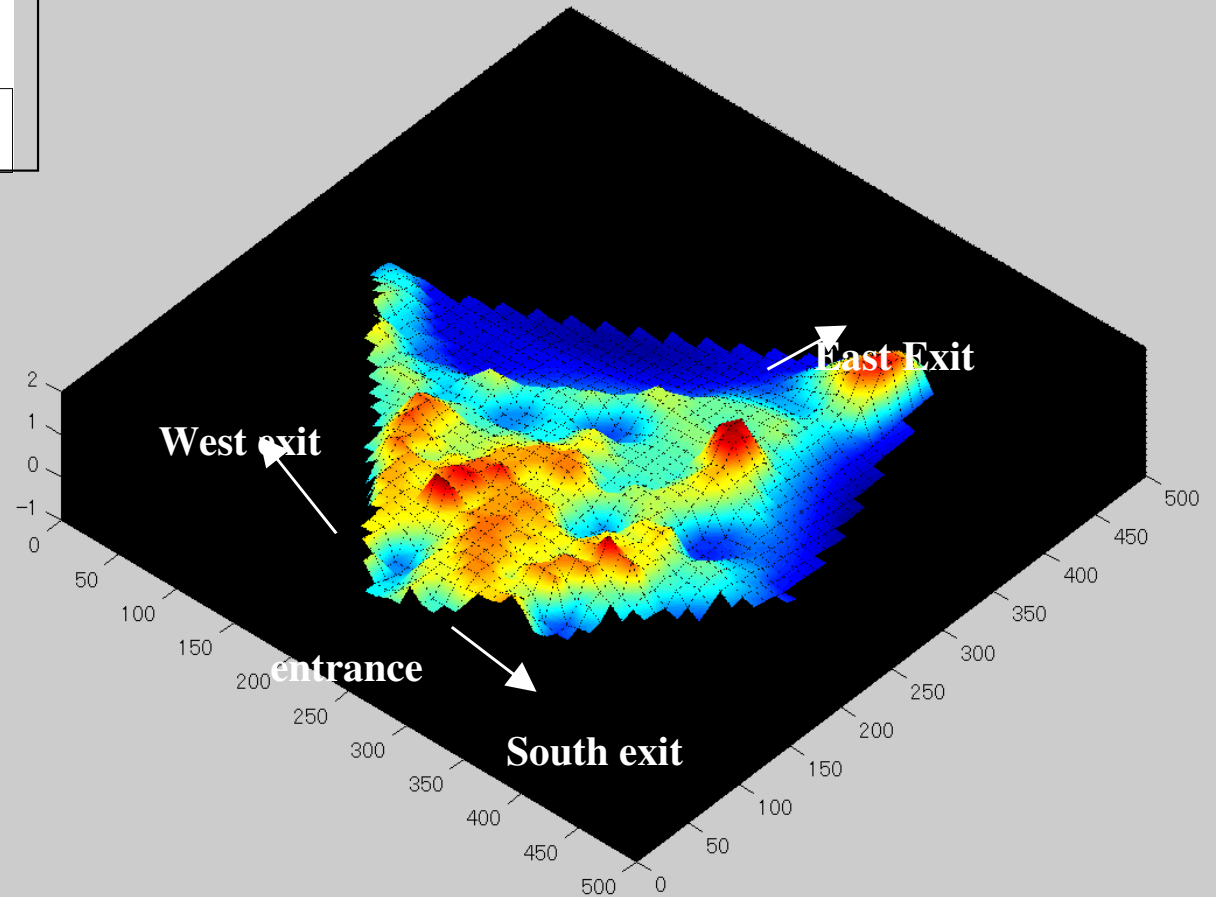
Analysis on basic walking patterns



Main traffic flows

Distribution of walking speed in the concourse

→relationship between distance from walls, entrance, other peds



Identify the place where
2 traffic flows cross each other

Identify how peds avoid
obstacles