Optimierung von Personenströmen – ein iterativer Ansatz

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A people rich world
A people rich world
A data rich world

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“Today, we are drowning in data and starved for information”
Data Collection & Data Analysis

Fragmented data. Expensive data. Data not shared.

**NOT** one data collection method to “rule them all”.

Analysis algorithms are **NOT** tailored to local context.
Simulation & Decision Making Tools

Tools from nerds for nerds:

Too many parameters to adjust or black box tools.

NOT one tool to “rule them all”.

Results are not understandable for decision makers. Bad, boring visualizations.
A way forward?!
Schloß Schönbrunn

- Mit seinen 1,441 Zimmern ist das barocke Schloss eine der wichtigsten Sehenswürdigkeiten des Landes
- ~ 3 Mio. Besucher pro Jahr
Datenerhebung von unterschiedlichen, heterogenen Quellen
  • Bedarfsschätzung
  • Kalibrierung des Simulationsmodels

Crowd Modeling
  • Simulationsbasierte Vorhersage und Analyse des Besucherstroms

Decision Support Tool
  • Kombination von Analyse von Personenstromdaten und Simulation
  • Vergleich und Bewertung unterschiedlicher Szenarien in kurzer Zeit
INVESTIGATE DIGITAL TRACES OF PASSENGERS AT TRANSPORT HUBS

ONE DAY AT GARE DE LYON
Art traffic at Louvre and prediction of visitor flows

http://senseable.mit.edu/louvre/
SELECTION OF MODEL CLASS

- Macroscopic or microscopic model?
  - In many rooms, nearly one-dimensional movement
  - One way tour design
  - Audio guide / tour guide
  - Computational performance / applicability
• Consulting for “Donauinselfest” (since 2009)
• Largest open air festival in Europe (3 million visitors in 2012)
• Evaluation of proposed guiding measurements
• Several scenarios and evacuation sceneries simulated and analyzed
MACROSCOPIC MODEL

Directed Graph with nodes in each room and at each door

... and links with capacity limit

Velocity as a function of density on the link

Waiting Areas: waiting time determined by audio guide length

flow rate limit at the doors
DECISION SUPPORT TOOL

- Combines the analysis of crowd flow data and macroscopic simulation
- Enables to compare a multitude of scenarios within a short time frame (i.e. simulating an entire day within several minutes)
• Room 5: problem with congestions (peaks with higher density occur)
• With the help of marketing measures, 50% of visitors that have originally chosen the „Grand Tour“ are choosing now the „Highlight Tour“.
• No congestions in room 5 anymore!
Informed selection of the right tools for your question!

Mix different data sources - no single sensor or method can give you the right answer!

Tailored development/adaption of (open source) analysis & simulation tools for your question compatible with your other systems!