Evaluation of a Support System for Large Area Tourist Evacuation Guidance - Kyoto Simulation Results -

Seiki Kinugasa, Tomoko Izumi and Yoshio Nakatani
Ritsumeikan University in Japan
Introduction
The present state of Japan
- Takes countermeasures
- Concentrates tourism

Countermeasures target residents and **not tourists**
The main street for tourists in Kyoto
Countermeasures of Kyoto

- Major tourist sites
- Kyoto station

Map: Kyoto city

1 mile
1 km
Countermeasures of Kyoto

- Phased evacuation with guides

Map: Kyoto City
Problems

- Countermeasures for residents are not applicable for tourists.
- Large evacuation area has to be considered.
- It is not easy to propose an effective evacuation method.
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Proposal
Can compare and evaluate the various types of guidance.
Input and an example

- Origin
- Staging post
- Waiting time at the staging post
- Destination
- Evacuation route
- Number of evacuees

Evacuation method

System

Input
Input and an example

- **Origin**: Kiyomizu Temple
- **No staging post**
- **Destination**: Kyoto station
- **Number of evacuees**: 12,000

- **Origin**: Nijo castle
- **No staging post**
- **Destination**: Kyoto station
- **Number of evacuees**: 4,000
Evacuation behavior

Equation of the speed
\[ V (\rho) = 1.1 \rho^{-0.7954} \]

- \( V \): speed (meter / second)
- \( \rho \): crowd density (persons / m²)

※Refer “pedestrian planning and design”, John J. Fruin
Evaluation Result
Conditions

- In case of earthquake occurrence in Kyoto
  - Train service is disrupted
  - Tourists wait in staging posts
  - Train service is resumed
  - Guides move them to the station
Evacuation guidance – A

Origins

Kyoto station

System Screen during the input
Evacuation guidance – A

Screen after 100 minutes

Okazaki Park
Maruyama Park
Merging point
Evacuation guidance – B

Origins

Kyoto station

System Screen during the input
Evacuation guidance – B

Screen after 160 minutes

Okazaki Park
Maruyama Park

No merge
Evacuation guidance – C

Origins

Kyoto station
Evacuation guidance – C

Screen after 160 minutes

Okazaki Park
Maruyama Park
No merge
The situation in Kyoto station

- A
- B
- C

person

hour
Conclusion
Conclusion

- An user can recognize the specific features of various large-scale guidance for tourists

- The countermeasures for tourists are very important for tourism nation