Ambulance Simulator

Takuhiro KAGAWA
Naoya YABUKI

Graduate School of System Informatics, Kobe University
Nakamura Lab.

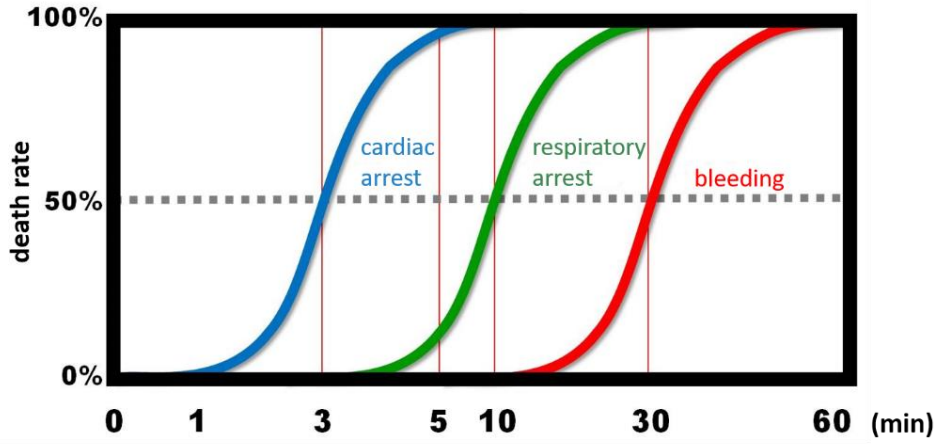
Dispatch of Ambulance in Japan

These are Statistics in 2016

- Number of Dispatch : 6.2millions
- Average arrival time : 8.5minutes
- Both are increasing year by year

Arrival time of ambulances influences death rate

- cardiac arrest
  - 50% dies after 3 min
- respiratory arrest
  - 50% dies after 10 min
- Heavy bleeding
  - 50% dies after 30 min



Important to minimize the arrival time of ambulance

Data recording ambulance dispatch

- Kobe Fire Department collects data for every dispatch
  - Time of emergency call(119)
  - Time of dispatch
  - Time of departure
  - Time of arrival at scene
  - Time of arrival at hospital
  - Time of return
  - Dispatched squad
  - Address of destination
  - Type of disease
  - Severity
  - Personal profile
  - Hospital sent
- Kobe city wants a data-driven approach to
  - Grasp the current situation of ambulance dispatch
  - Improve the strategy of ambulance dispatch
- Our team at Kobe Univ. has started collaboration

Ambulance Simulator

Considering the best way of dispatching ambulance

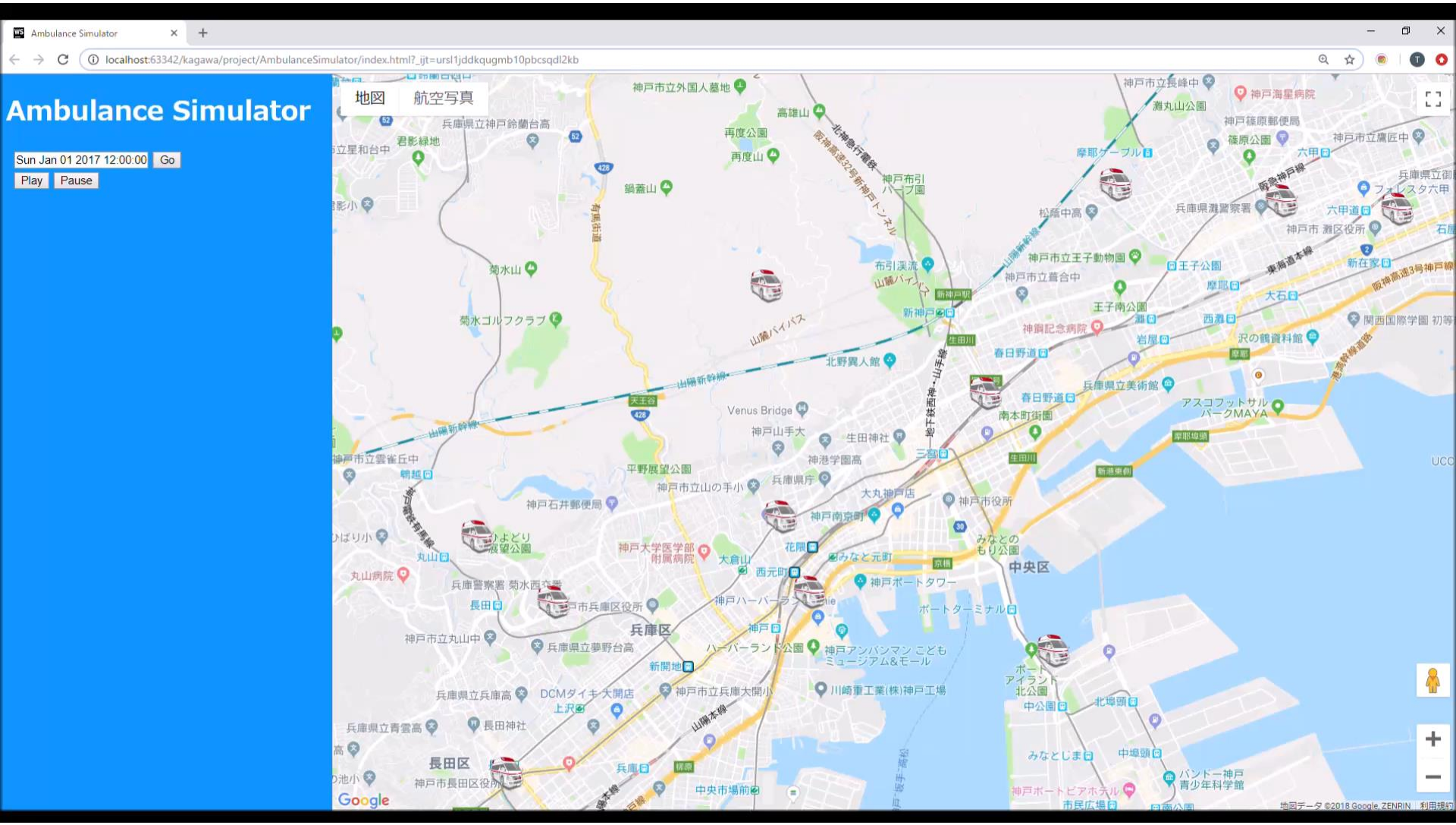
- Visualize by animation when and where the ambulance moved
  - In which area are ambulances called frequently?
  - Which of squads is busier than others?
  - How long does each dispatch run?

- Simulate the dispatch strategy
  - What happened if different squad had been assigned for the call?
  - What happened if another call had occurred?

Ambulance Simulator is currently under development

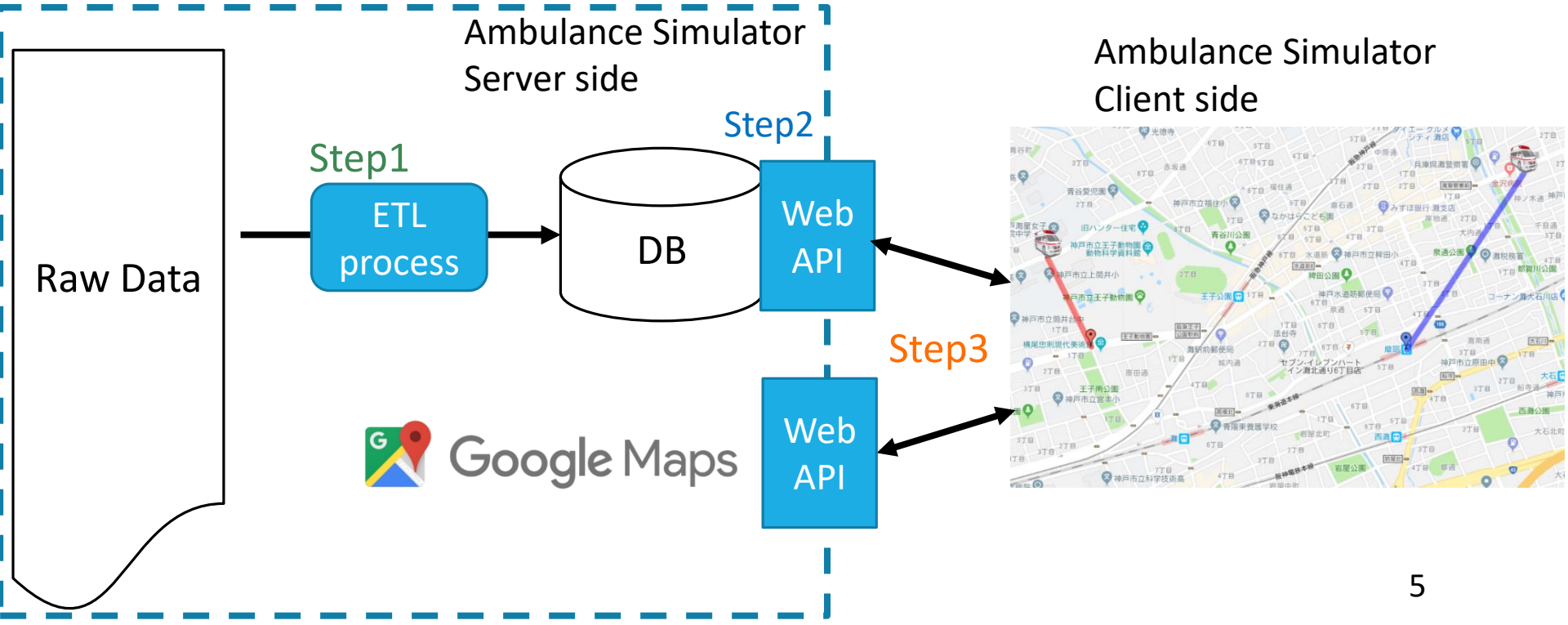
- This presentation covers “visualize by animation” feature only

Demonstration



System Architecture

- Implement as Web application, adopting SOA
  - Step1: For every minute, for every squad calculate position and status, and insert into database (ETL: Extract, Transform, Load)
  - Step2: Develop Web-API to retrieve the data for every minute
  - Step3: Mash-up the Web-API with Google maps to visualize



Conclusion

- Ambulance Simulator helps better ambulance dispatch
  - Visualize by animation when and where the ambulance moved
  - Simulate the dispatch strategy
- Currently implemented as Web application
  - Web-API to retrieve the data for every minute
  - Mash-up the Web-API with Google maps to visualize
- Future work
  - Develop feature of simulation of dispatching ambulance
  - Evaluate how Ambulance Simulator helps