

Network Failure Detection System for Traffic Control using Social Information in Large-Scale Disasters

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Introduction

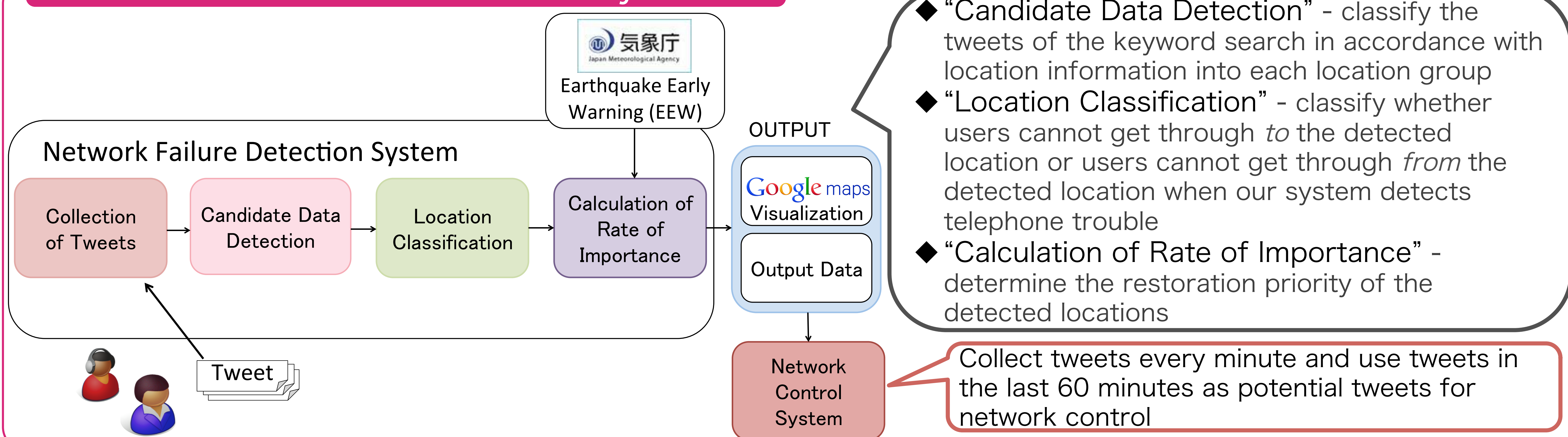
Necessity of Network Failure Detection in Large-Scale Disasters

- ◆ Large-scale disasters such as earthquakes often cause network failures
- ◆ When the Great East Japan Earthquake occurred in 2011, it was difficult to quickly grasp all network conditions

Utilizing the Collective Intelligence of Social Networking Services

- ◆ In subsequent research on the Great East Japan Earthquake, survey participants responded that they were able to use Twitter

Network Failure Detection System



Calculation of Rate of Importance about Location Information

- ◆ When the Great East Japan Earthquake occurred in 2011, it was difficult to prioritize locations for the efficient area restoration
- ◆ Prioritize the detected locations using **three indicators**

➤ Prediction of seismic intensity on the detected locations

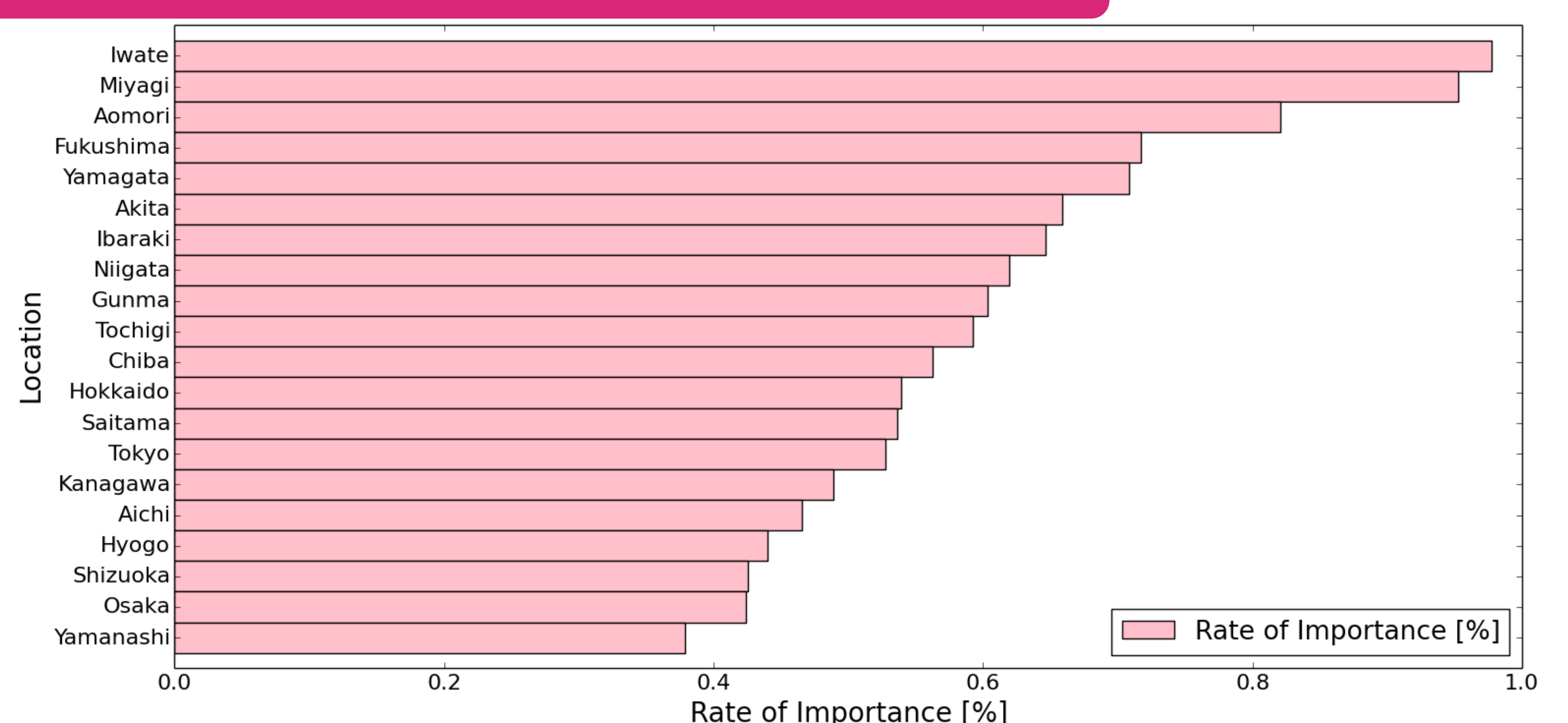
- use external information such as EEW

➤ Result of the location classification

- obtain the rate of tweets that mean users cannot get through to the detected location

➤ Rate of increase of tweets in emergency

- compare with tweets at the non-emergency time



Rate of Importance when the Great East Japan Earthquake occurred

- ◆ Locations where damage was great have high rate of importance
- ◆ Our system prioritized locations using three indicators

Network Control System based on analysis results of SNS

◆ Construct a network control system

- ❖ Optimize the network traffic automatically using information on the network load that is detected by a network failure detection system
- ❖ Use architecture called FLARE to perform the routing control

FLARE : Deeply Programmable Network

- ◆ Migrated a network failure detection system on FLARE Central

- ◆ Operated a control program of RYU based on information that was detected by the system

RYU : Software Defined Network Framework

