

# Development of the traffic system at a disaster with Multi-Agent Simulation and reliability analysis of travel time on road network

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# 2005 Fiscal Year Final Research Report Summary

## Development of the traffic system at a disaster with Multi-Agent Simulation and reliability analysis of travel time on road network

Research Project

### Project/Area Number

16360254

### Research Category

Grant-in-Aid for Scientific Research (B)

### Allocation Type

Single-year Grants

### Section

一般

### Research Field

交通工学・国土計画

### Research Institution

KANAZAWA University

### Principal Investigator

**TAKAYAMA Jun-ichi** KANAZAWA University, Graduate School of Natural Science and Technology, Professor, 自然科学研究科, 教授 (90126590)

### Co-Investigator(Kenkyū-buntansha)

KIMATA Noboru KANAZAWA University, Graduate School of Natural Science and Technology, Professor, 自然科学研究科, 教授 (30026166)

NUMADA Michiyo KANAZAWA University, Graduate School of Natural Science and Technology, Research Associate, 自然科学研究科, 助手 (10180689)

YANAGISAWA Yoshiyasu Nagano National College of Technology, Department of Civil Engineering, Associate Professor, 環境都市工学科, 助教授 (70191161)

FUTAGAMI Touru Ehime University, Center for Information Technology, Assistant Professor, 総合情報メディアセンター, 講師 (40229084)

### Project Period (FY)

2004 – 2005

### Keywords

Multi-Agent Simulation / Reliability of travel time / uncertainty of travel time / An urgent vehicle(a fire engine / an ambulance) / Petri-net Simulation / A road network at the time of a disaster / Spread of a fire simulation / Refugee traffic action model

### Research Abstract

In this study, we developed the traffic model who expressed a route choice of a driver with a multi-agent simulation system. We adapted ourselves in the model that we developed the model that evaluated reliability for running time of a car and developed for a virtual model network and a real road network for a road network when a big

earthquake occurred, we developed the system which predicted outbreak of a simultaneous frequent occurrence fire and the situation of spread of a fire. In addition, we evaluated access characteristics of an emergency vehicle at the time of an earthquake disaster, and having considered the allocation of cars of an urgent vehicle (a firefighting pump car, an ambulance) of each fire department place by reliability analysis of a road network.

We developed the system which predicted the area where an access characteristic of an urgent vehicle for a road network of normal time (in normal) was low by using the reliability analysis system. And we predicted how a road network was damaged at the time of an earthquake disaster and developed the model in order to built a road network. But, about the prediction model of a refuge traffic action, we built a system with a multi-agent of adaptation model. We developed the model that predicted how it occurred and how spread with time where a simultaneous frequent occurrence fire at the time of an earthquake occurred.

We get possible to calculate the area where a firefighting vehicle must arrive at early by utilizing an above system. We developed a traffic micro-simulation system with Petri-net simulator to run a general vehicle and a first aid vehicle at the time of an earthquake disaster. We analyzed the most suitable course instruction that utilized ITS technology and an effect of the most suitable signal control for normal time and after big earthquake outbreak.

## Research Products (42 results)

All	2006	2005	2004
All	Journal Article		

[Journal Article] 不確実性を考慮した時間常別確率均衡配分モデルに関する研究	2006	▼
[Journal Article] 複素数空間を用いてサイクル経路を除去した吸収マルコフモデルによるOD交通量推計に関する研究	2006	▼
[Journal Article] バス優先レーン策のペトリネットシミュレーション研究	2006	▼
[Journal Article] 交通機関分担を考慮した最適バス路線網システムの構築に関する研究	2006	▼
[Journal Article] 信号交差点部における緊急車両走行支援のペトリネットシミュレーション研究	2006	▼
[Journal Article] 地震時火災避難計画シナリオのペトリネットシミュレーション開発	2006	▼
[Journal Article] 適応的マルチエージェントを用いた災害時における交通情報提供に関する影響評価	2006	▼
[Journal Article] ITSを活用した災害時における緊急車両の走行支援に関する研究	2006	▼
[Journal Article] Eco-Travel Coordinator Program : The Effects on Travel Behavior and Environmental Attitude	2006	▼
[Journal Article] Time-of-Day Stochastic User Equilibrium Assignment Model Considering the Uncertainty	2006	▼
[Journal Article] A study on OD estimation model by Absorbing Markov Chain model that removed a cyclic course by Complex Number Space	2006	▼
[Journal Article] Study on A Bus Priority Lane by Petri Net-Simulation	2006	▼
[Journal Article] A Study about Construction of the Most Suitable Bus Route Network System which Considering Means of Transportation Allotment	2006	▼
[Journal Article] Study on the Driving Support of an Emergency Vehicle in the Signal Crossing by Petri Net-Simulation	2006	▼
[Journal Article] Development of Scenario of an Earthquake Time Fire Refuge Plan by Petri Net-Simulation	2006	▼
[Journal Article] Assessment about Traffic Information with Adaptation Multi-Agent at Disaster	2006	▼
[Journal Article] A Study about Driving Support of an Emergency Vehicle at the Time of the Disaster that Utilized ITS	2006	▼
[Journal Article] 旅行時間の不確実性を考慮した分担・配分統合交通ネットワーク均衡モデル	2005	▼
[Journal Article] ペトリネットシミュレータによる背景画像上での地震時緊急路の点検・構築支援システム	2005	▼
[Journal Article] 火災延焼シミュレータを用いた防火樹木整備による防災まちづくり支援	2005	▼
[Journal Article] ペトリネットシミュレーターを用いた中山間地域の避難計画支援に関する研究	2005	▼
[Journal Article] ペトリネット・シミュレータを用いた中山間地域の災害孤立対策に関する研究	2005	▼

[Journal Article] 通勤時自動車交通を対象とした経路選択特性の要因分析	2005	▼
[Journal Article] サイクリック経路を除去した吸収マルコフモデルによるOD交通量推計に関する研究	2005	▼
[Journal Article] 需要変動を考慮した最適バス路線網策定システムの構築	2005	▼
[Journal Article] 最近のCABG-日帰りCABG, awake CABGを中心に-	2005	▼
[Journal Article] 冠動脈バイパス術における低侵襲化の将来	2005	▼
[Journal Article] 高齢者OPCABの適応と術式	2005	▼
[Journal Article] Thoracic Epidural Anesthesia for Coronary Bypass Surgery Affects Autonomic Neural Function and Arrhythmias	2005	▼
[Journal Article] Development of Petri Net Simulation for Evacuation Scenario in Building on Its Background Image	2005	▼
[Journal Article] Practical study of Probe technology to Its Background Image by EVACUATION Petri Net Simulator	2005	▼
[Journal Article] Development of the Scenario Simulation for the Emergency and Refuge Planning in the Intermediate and Mountainous Area	2005	▼
[Journal Article] Construction of a Disaster Time Course Choice Action Model and Analysis About a Information Effect	2005	▼
[Journal Article] A Combined Network Equilibrium Model Considering Travel Time Uncertainly	2005	▼
[Journal Article] Support System for Inspection and Build-up of Emergency Road-Network at Earthquake by Petri Net Simulator Using on Background Image	2005	▼
[Journal Article] Disaster prevention town planning by the fire prevention trees maintenance using the fire-risk simulator	2005	▼
[Journal Article] Study on the refuge planning in the intermediate and mountainous area supported by Petri-net simulator	2005	▼
[Journal Article] Study on the Measure of the Isolated Disaster in an Intermediate and Mountain area by Petri Net-Simulator	2005	▼
[Journal Article] Analysis of a choice factor about a car commuting course	2005	▼
[Journal Article] A study on OD estimation model by Absorbing Markov Chain model that removed a cyclic course	2005	▼
[Journal Article] Construction of the Most Suitable Bus Route Network Development System which Considering a Demand Change	2005	▼
[Journal Article] 車イスによる入退室を可能とした硬膜外麻酔による冠動脈バイパス術	2004	▼

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