DSS

Automated Decision Support System for safety in Road Tunnels in case of unusual events, using computer modelling and simulation

Sistema Automatizado para la toma de Decisiones (DSS) de Seguridad en Túneles de Carretera ante Sucesos Infrecuentes mediante el Modelado y Simulación Computacional

Funding: National (Spain)
Duration: Jan 2008 - Dec 2009
Status: Complete

Background & policy context:

Unusual events in road tunnels (fire, accidents, landslide, etc) entail high risk situations that put people's lives in danger and cause significant material damage. These events are so diverse and infrequent that it is very difficult to take good decisions in situations of limited and contradictory initial information, with quick changes and uncertain development.

Objectives:

The main aim of this project was to develop an automated decision support system in road tunnels in order to improve the management of emergency situations and minimise damage/risk in case of unusual events.

Methodology:

Initially, the project analyses, classifies, typifies and statistically processes data on unusual events in different road tunnels. This will allow the development of mathematical models that can predict impact variables (number of deaths, people who need to be rescued, people who can be evacuated by themselves, etc). This is used as input to computational simulation models for evacuation. These models predict human movement and behaviour during evacuation.

Simulation of evacuation phenomena, with the use of optimisation algorithms, then allows the project to obtain recommendations for decision-making.

Results will provide an interactive system with feedback, allowing the proposals of decisions to be tuned while the event is still ongoing, through the introduction of complementary information about the development and efficacy of the measures adopted before, as an evaluation for future research. Therefore, the system could have the possibility to include a learning module. This learning module will study neural networks.

Parent Programmes:
PEIT - Strategic Plan of Infrastructures and Transport

Institute type: Public institution
Institute name: CEDEX (Centro de Estudios y Experimentación de Obras Públicas); part of the Ministry of Public Works and Infrastructures
Funding type: Public (national/regional/local)

Partners:
Spain: GIDAI-Universidad de Cantabria

Organisation: GIDAI-Universidad de Cantabria
Avda. de los Castros, s/n., Edificio ETS Ingenieros de Caminos, Canales y Puertos.

Address: Santander
Zipcode: 39005
City: Santander
Contact country: Spain
Telephone: (+34) 942 20 17 50
Fax Number: (+34) 942 20 17 03

Organisation Website: Organisation website

Documents: Project description (Other project deliverable)

STRIA Roadmaps: Infrastructure

Transport mode: Road transport

Transport policies: Societal/Economic issues, Safety/Security, Decarbonisation