

General information

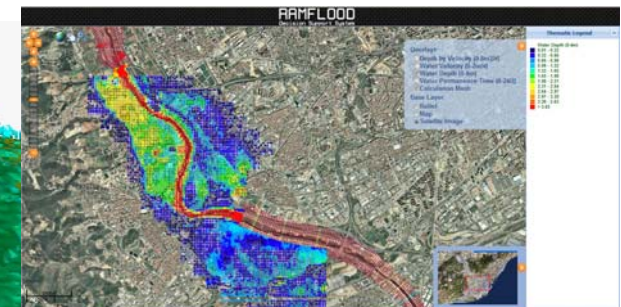
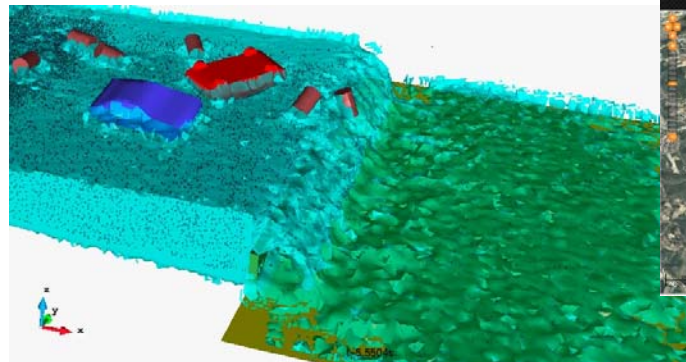
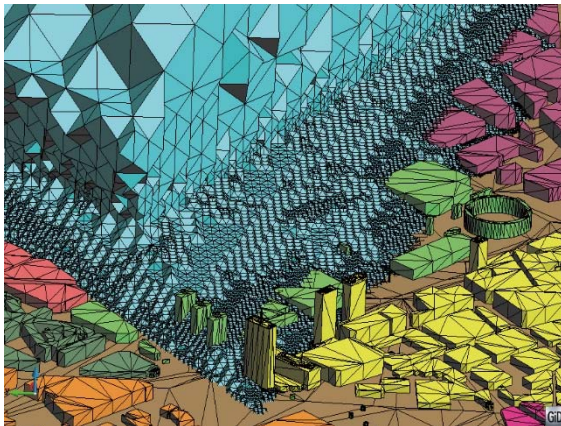
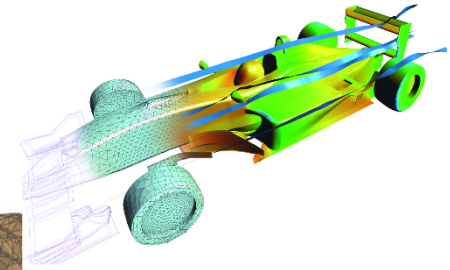
CIMNE: International Centre for Numerical Methods in Engineering

TYPE: Public research center located in BARCELONA (UPC campus)

Contact name Dr Cecilia Soriano - Research Manager

Email: csoriano@cimne.upc.edu

Telephone number: (+34) 93 401 7440



Targeted topics

SU-INFRA01-2018-2019-2020: Combined physical and cyber threats

SU-INFRA02-2019: Security for smart and safe cities, including for public spaces

Competencies

Organisation competencies

Research

Education

Dissemination

Technology Transfer

IN THE FIELD OF **SIMULATION** (COMPUTATIONAL MECHANICS)



Organization experience in the European project

CIMNE has participated in some 150 projects of EC programmes and has acted as coordinator in 40 of these project

The skills you can bring

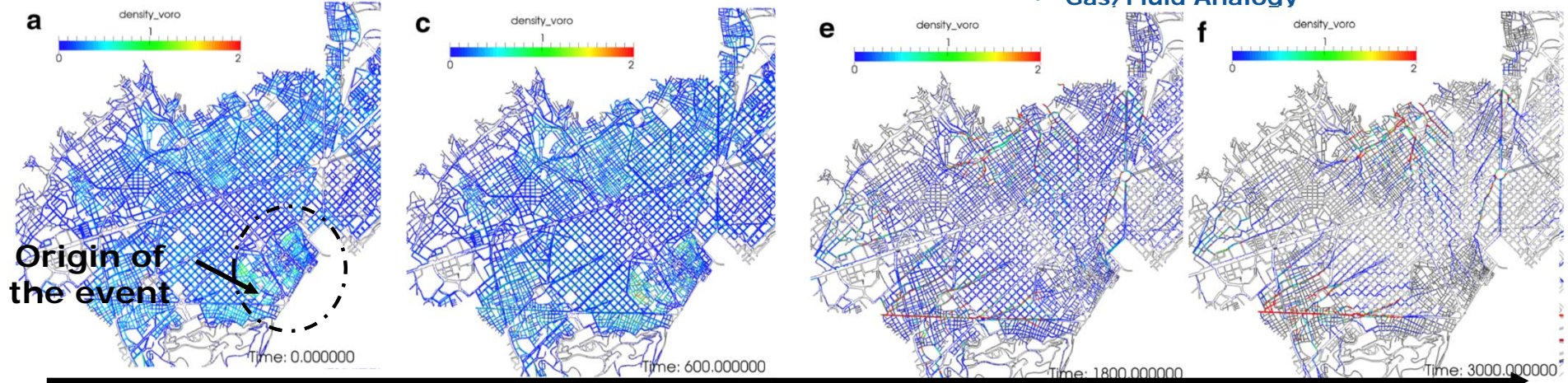
PEDESTRIAN FLOW SIMULATIONS: Simulation of the movement of large crowds of people, either in open spaces (example that we include for a Barcelona stage) or in closed spaces (for example, simulation of the evacuation of a stadium or a metro station).

VULNERABILITY ASSESSMENT for infrastructures against explosions/blastings: A tool derived from the EC DESURBS Project) that we have been improving

QUOTATION FROM TOPICS DESCRIPTION: "...smart cities provide for improving the security of open and **crowded areas** against threats..."

EVACUATION OF BARCELONA

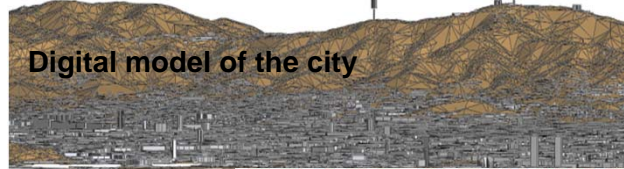
PEDESTRIAN FLOW SIMULATION
through computational crowd dynamics



Time = 0 s

Time = 3000 s

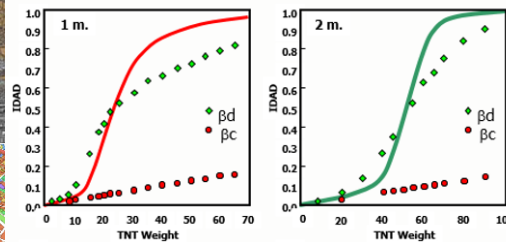
QUOTATION FROM TOPICS DESCRIPTION: "... should: (a) assess in detail all aspects of interdependent physical (e.g. **bombing**, sabotage and attacks ..."



Digital model of the city



Urban classification
Masonry
Concrete
Steel
Wood



VULNERABILITY CURVES
(Explosive load vs. Damage)

GIS
based
system

Estimated risk
in buildings by
an explosion



What

- Situations with many Individuals

Why

- Evacuation
- Avoid Injury/Death

How

- Gas/Fluid Analogy