# Smart 3D indoor models to support crisis management in large public buildings (SIMs3D)

8-9-2015

- Kick-off meeting with end users

# Agenda, Part 1 (13:00- 14:50)

1. Opening by the chairman (13:00-13:05) — Project leader
2. Agenda & announcements (13:05-13:10) — Project leader & All
3. STW presentation (13:10-13:40) — Program officer
4. Outline of the project (13:40-14:00)
    1. General overview — Project leader
    2. UT (AIO, supervisor) — Michael Peter
    3. TUDelft (postdoc) — Abdoulaye Diakité
5. Users (14:00-14:50) — All Users (5 min per user)
    1. Reasons for participation
    2. Expectations and wishes
    3. Contributions

# Agenda, Part 2 (14:50 - 15:30)

7. Progress of the project (14:50-15:10) — Project leader & Researchers
    1. Past, current and future plans
    2. Questions for the Users
    3. Related projects & possible collaborations

8. 7. Use of results (valorisation) (15:10-15:20) — All
    1. Progress towards wishes of Users
    2. Protection intellectual property rights (non-disclosure, patents, etc.)
    3. Publications, presentations, Internet
    4. Recognisable moments of knowledge transfer

9. Any other business and date next meeting (15:20-15:30) — Project leader
10. Close meeting & Excursion/demonstration (15:30-16:00) — Project leader/Michael Peter

# Researchers & M4S

- Delft University of Technology
  - Sisi Zlatanova
  - Abdoulaye Diakité
  - Florian Fichtner
- University of Twente
  - George Vosselman
  - Michael Peter
  - Shayan Nikoohemat
- Map for Society (M4S)
  - Magdalena Siwko-Rampioni
  - Lorna Woods

TU Delft
Delft University of Technology

UNIVERSITY OF TWENTE.

maps 4 society

# Companies & End users

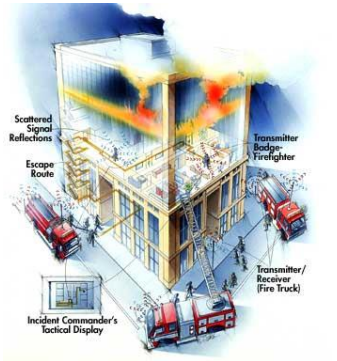
- CycloMedia Technology BV (Bart Beers)
- CGI (Robert Voûtre)
- Crotec BV (Matty Lakerveld)
- Leap 3D (Ester de Bruin)
- OGC (Bart de Lathouwer)

- Brandweer Nederland (Rob Peters)
- Brandweer Rotterdam-Rijnmond (Vincent Oskam)

- Veiligheidsregio Hollands Midden (Arthur Haasbroek)
- Veiligheidsregio Limburg Noord (Mario van Wanrooij)
- Veiligheidsregio Noord en Oost Gelderland (Henk Djurrema)
- Veiligheidsregio Twente (Gerke Spaling)
- Stichting Studio Veiligheid (Peter de Bruin)

# Problem statement

- Management of large public buildings in emergency cases requires:
  - up-to-date 3D indoor models
  - detailed geometric and semantic information
  - automatic approaches for navigation
- Intelligent models of 3D indoor environments is largely missing
- Use (preparedness and response)
  - train the emergency response officers (BHV)
  - plan optimized evacuation routes
  - quickly built rough 3D models
  - provide context-aware navigation.

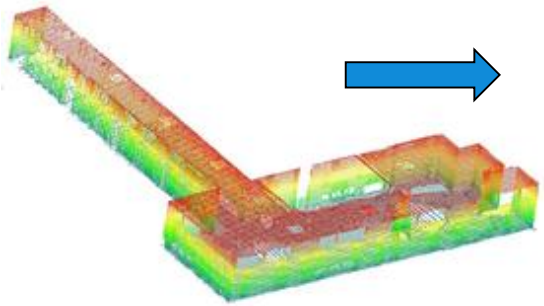


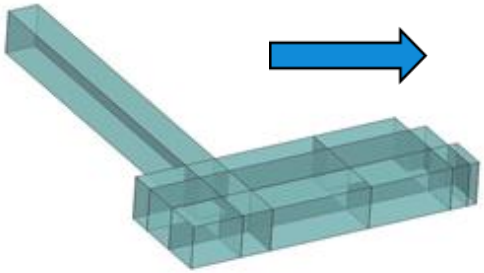


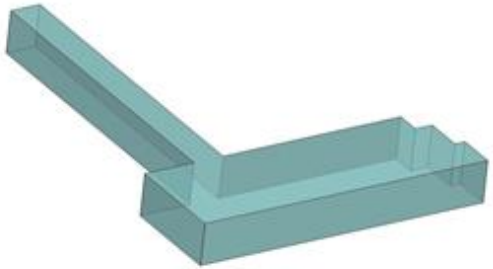
*ICS Training simulation allows users to play one of six available first responder roles in a choose-your-own-adventure style of gameplay.*

# Tools

Grammar !



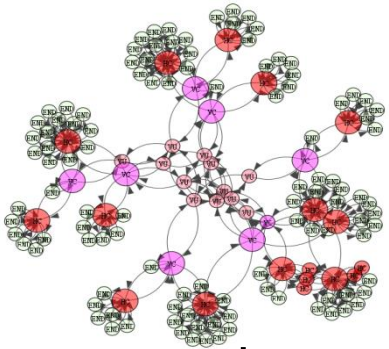




- point cloud

cuboid shapes

final model

- 3D model

space subdivision

network

# Challenges

- 3D reconstruction from point clouds
- Semantic/topology models for navigation

- Objectives:
  - a shape grammar for (semi-) automated generation of semantically-rich 3D models of indoor environments from point clouds

  - a space subdivision/aggregation grammar to create a network and support navigation of multiple stakeholders who need to orient and find resources (exits, rooms, indoor facilities, items in cupboards

# Reseach questions

- How can grammar rules (their sequence and parameters) be established from  the point cloud?
- What level of semantics (rooms, corridors, furniture) is needed for optimal path finding?
- Which of the semantic information can be derived automatically from the data or the model?
- What kind of data models can integrate the information about spaces, their properties and relationships?
- Which kind of grammar is needed to allow subdivision or aggregation of spaces into sufficiently small or large cells to provide the best networks?

# Work packages

- WP1 3D modelling of indoor environments: point clouds and images. PhD student, UT
- WP2 Semantic models (geometry and topology): subdivision and navigation. Postdoc, TUD, OGC
- WP3 User requirements and use cases. Fire brigade in the Netherlands. Brandweer Nederland (iNowit), Veiliheidsregios Cyclomedia
- WP4 System Integration. TUD, UT, CGI.
- WP5 Dissemination: web site (wiki), organisation of workshops and hands-on sessions, presentations at OGC meetings and international conferences and 4-6 journal publications.