Chair of Computational Modeling and Simulation
TUM School of Engineering and Design
Technical University of Munich

TUM

Modeling:
Mathematics:
Programming:
Science:

Software Lab:

Machine Learning for Fire Fighting Rescue Missions

Description

*Path planning through indoor environments allows first responders to reach and rescue victims faster in hazardous situations. Semantically enriched BIM models can be used for fire rescue emissions to provide first responders with crucial information. However, most BIM models are not necessarily enriched with this detailed information. Instead, firefighters get their information from so-called operation plans (Feuerwehr-Laufkarten auf Deutsch). Extracting this information and processing it together with the results from state-of-the-art path planning calculations is a time-consuming and unnecessary step. One of the 2022s software lab groups has trained a machine learning model which can read the symbols from emergency floor plans and also produce a floorplan and then place the symbols in this floor plan. Now, this module should be developed further. Your task is to adjust it according to firefighters' operation plans, match the resulting plan with an existing BIM model and thus provide information about the location of valuable information in a building to a state-of-the-art path planning. The task is conducted in cooperation with the **EU Horizon 2020 INTREPID Project**.*

Figure 1 Method from last year's softwarelab. [2]

Task

- A trip to the fire fighting station of the TU Munich where they introduce us into the common procedure in using the so called operation plans (Laufkarten).
- Get yourself familiar with the existing machine learning model
- Adjust the model and train the model with the operation plans
- Match the output of the machine learning model with a BIM Model to provide location information with the semantic information
- Extra task: Display the information in the 3D-BIM.

Supervisor

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References

[1] https://intrepid-project.eu/

[2] Softwarelab 2022 by Philip Ott and Mohab Hassan

[3] Feuerwehr Laufkarten (https://www.hr6.tum.de/fileadmin/w00bjm/feuerwehr/pdf/Anlage_Feuerwehrlaufkarte.pdf)