

SCCS Chair Retreat 2020 - Vadere Hands-On Session

Intro

Vadere is a simulation framework for pedestrian flow analysis. Vadere's core features:

- Command-line interface (CLI) and an easy-to-use GUI interface.
- Shipped with different locomotion models:
 - Gradient Navigation Model (GNM)
 - Optimal Steps Model (OSM)
 - ...

Motivation for pedestrian stream simulations:

- Improve design of buildings to minimize evacuation times.
- Simulate dangerous situations **without** harming real humans.
- ...

Goals for Hands-On Session

Get familiar with Vadere - its features and its limitations.

First Steps

1. Download Vadere from <http://www.vadere.org/releases/> (vadere.retreat2020.<operating_system>.zip)
2. Unzip vadere.retreat2020.<operating_system>.zip
3. Open vadere-gui.jar
4. In GUI, open Vadere project containing four examples: Project -> Open... -> ./Scenarios/Retreat2020/vadere.project

Examples

We prepared four small examples:

1. Get started with the first example and compare two different locomotion models in Vadere.
 - **Used scenarios:**
 - 01-MinimalExample-OptimalStepsModel
 - 01-MinimalExample-GradientNavigationModel
 - **Steps:**
 1. Get familiar with the GUI (i.e., input files, output files, toolbar, ...).
 2. Compare different locomotion models by running both simulations.
 3. Compare both simulations in the PosVis (see Output files section in the GUI)
 - How do the trajectories differ between OSM and GNM?
 - Visualize densities in both scenarios by drawing a rectangle with the "Voronoi diagram" tool in the toolbar.
2. In the second example, you should measure the density.
 - **Used scenario:** 02-Density-Measurement
 - **Steps:**
 1. GUI: Data output.
 2. Add a density processor (recommended: PedestrianDensityCountingProcessor with a radius of 1.5 [m]) to measure the density in each timestep for each pedestrian.
 3. Add a file to write the density information to (select TimestepPedestrianIdKey as Data Key and the output processor from (2)).
 4. Analyze output files: What is the max. observed density value? **Note:** Vadere stores the output to path/to/project/output/<scenario_run> (in GUI: Right-click on an output in the Output files panel and then Copy output path to clipboard)
3. Estimate how long it takes to evacuate 500 agents from Marienplatz and check your estimation against a simulation. **Note:** you may also increase the number of agents, but depending on your hardware the simulation may take a while.
 - **Used scenario:** 03-Marienplatz-Evacuation
 - **Steps:**
 1. What is a reasonable location and shape for source(s)?
 2. Place single or multiple targets to get a realistic simulation? **Note:** Make sure all targets have the same Id and the target id is used in the source(s) (field targetIds).
 3. How fast should the agents run? (Topography -> attributesPedestrian -> [speedDistributionMean | speedDistributionStandardDeviation])
 4. Use the PedestrianEvacuationTimeProcessor to measure the evacuation time per pedestrian. What is the maximum and mean evacuation time? **Note:** Select PedestrianIdKey as Data Key for the corresponding output file.