Intelligent Agents as Problem Solvers on Large 3D Landscapes

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The Virtual Region Møre

The basic idea

The Møre region

Real data

Research estimates

Model

Model learning
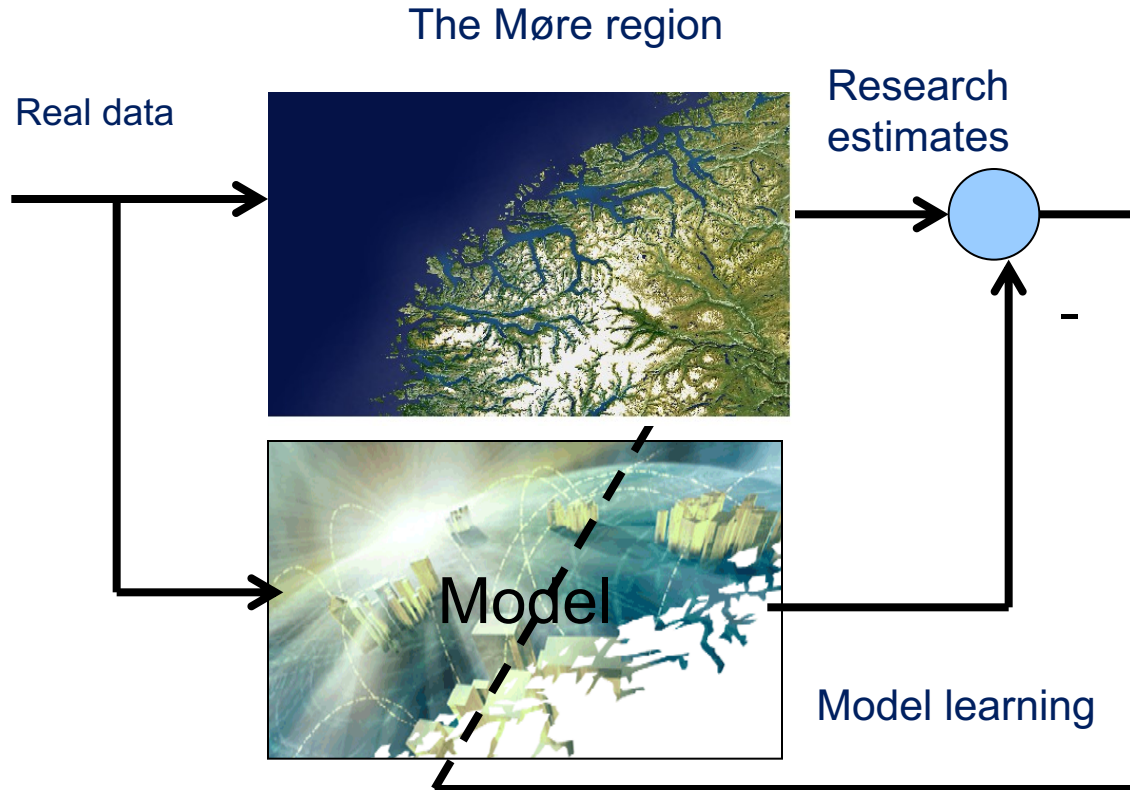
The research goal
1. Simulation and visualization and 3D maps as a research tool
2. Adaptive models for simulation and visualization

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I ÅLESUND

The Ålesund city

1. step: Integrate terrains and buildings

The Virtual Ålesund city
2. Step: Rendering houses

The Virtual Ålesund region
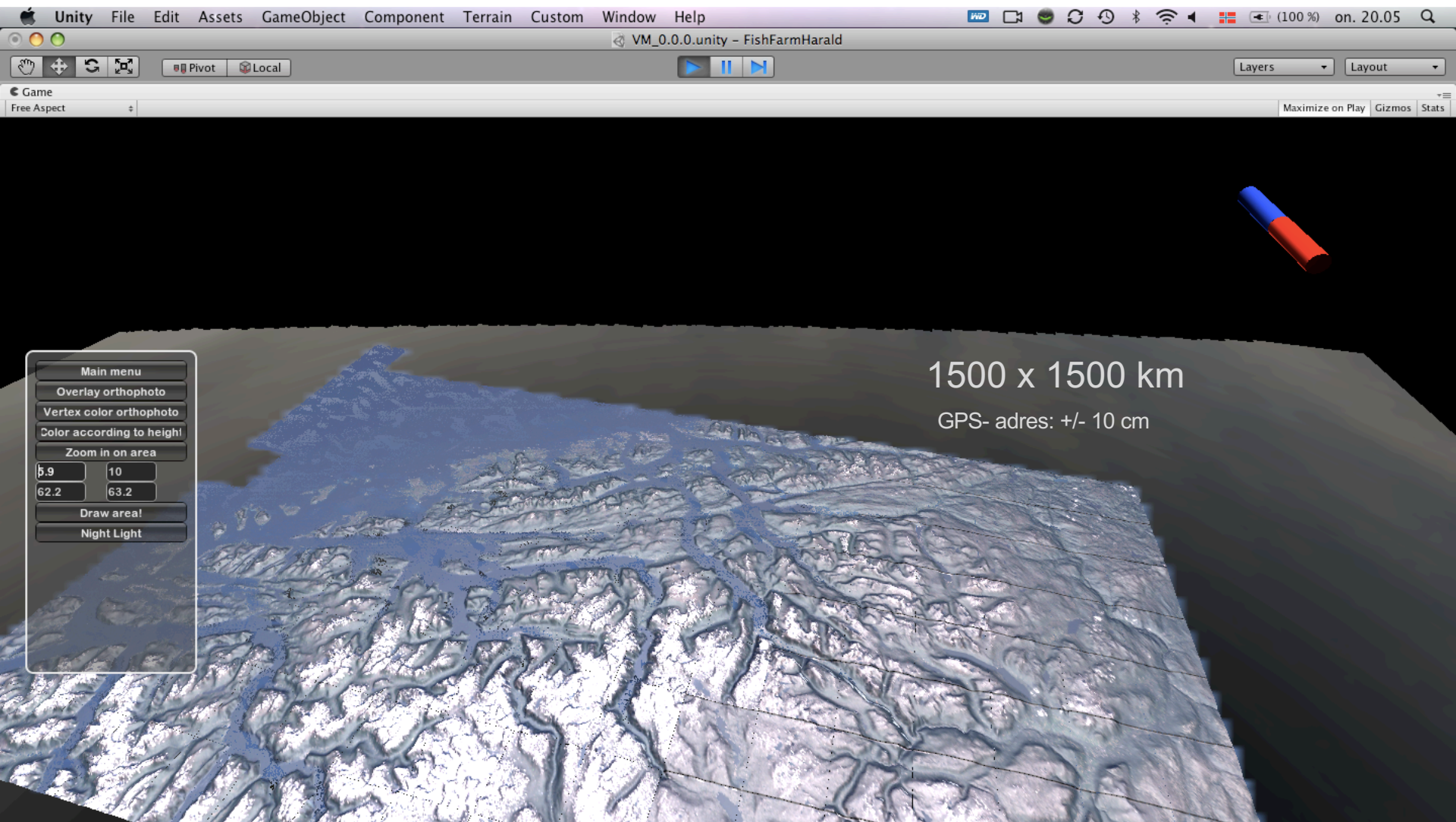
3. Step: Set the city in a region context
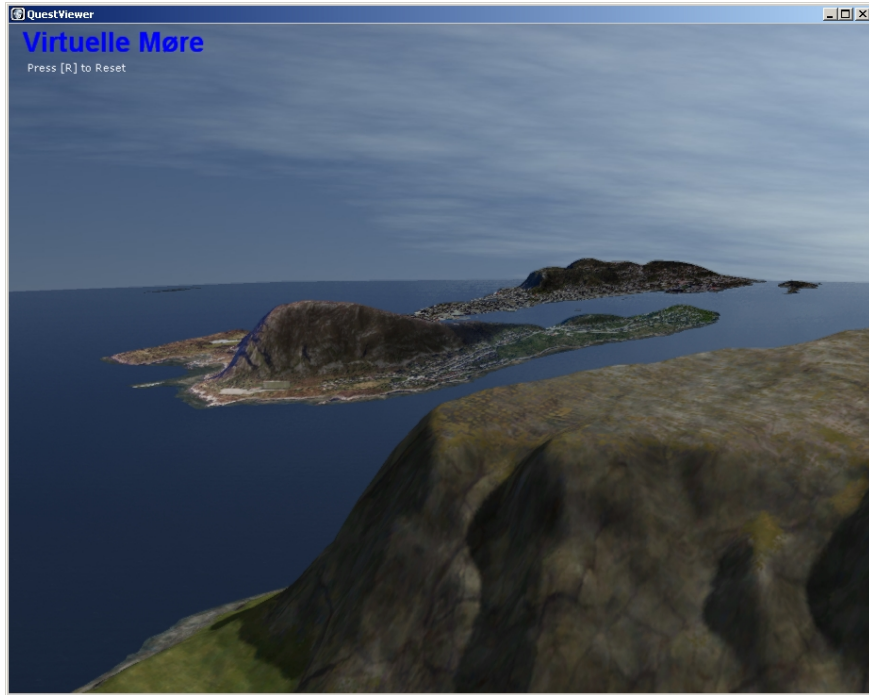
3D terrain model (15 x 15 km)

Introducing a game engine

Introducing Visual agents

Visual agents on a terrain

The Virtual Møre region
Large 3D landscape: GPS based 3D map

The Paradigm shift

From system dynamics, to individual dynamics

**From a deterministic paradigm, to a individual based free will**

A Generic concept:
1   Everything is Agent or landscapes
2   Adaptive Agents in landscapes
3   Social agents learning
4   Evolution agents learning
5   Time variant landscapes
6   Abstract landscapes as cost functions
7   Complex systems dynamics
8   Systems of systems

Needs a generic concept

Tube tunnel in a Norwegian fjord
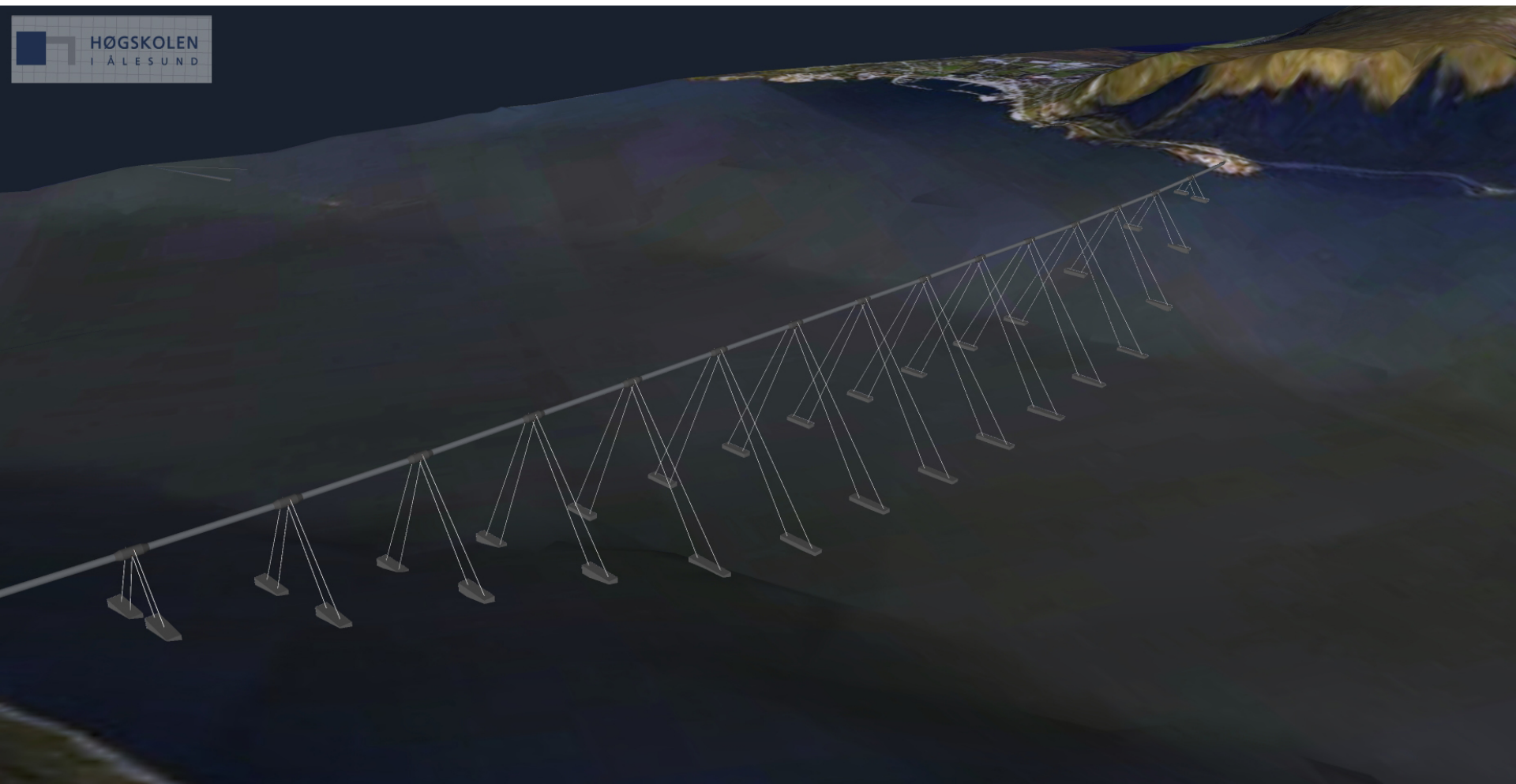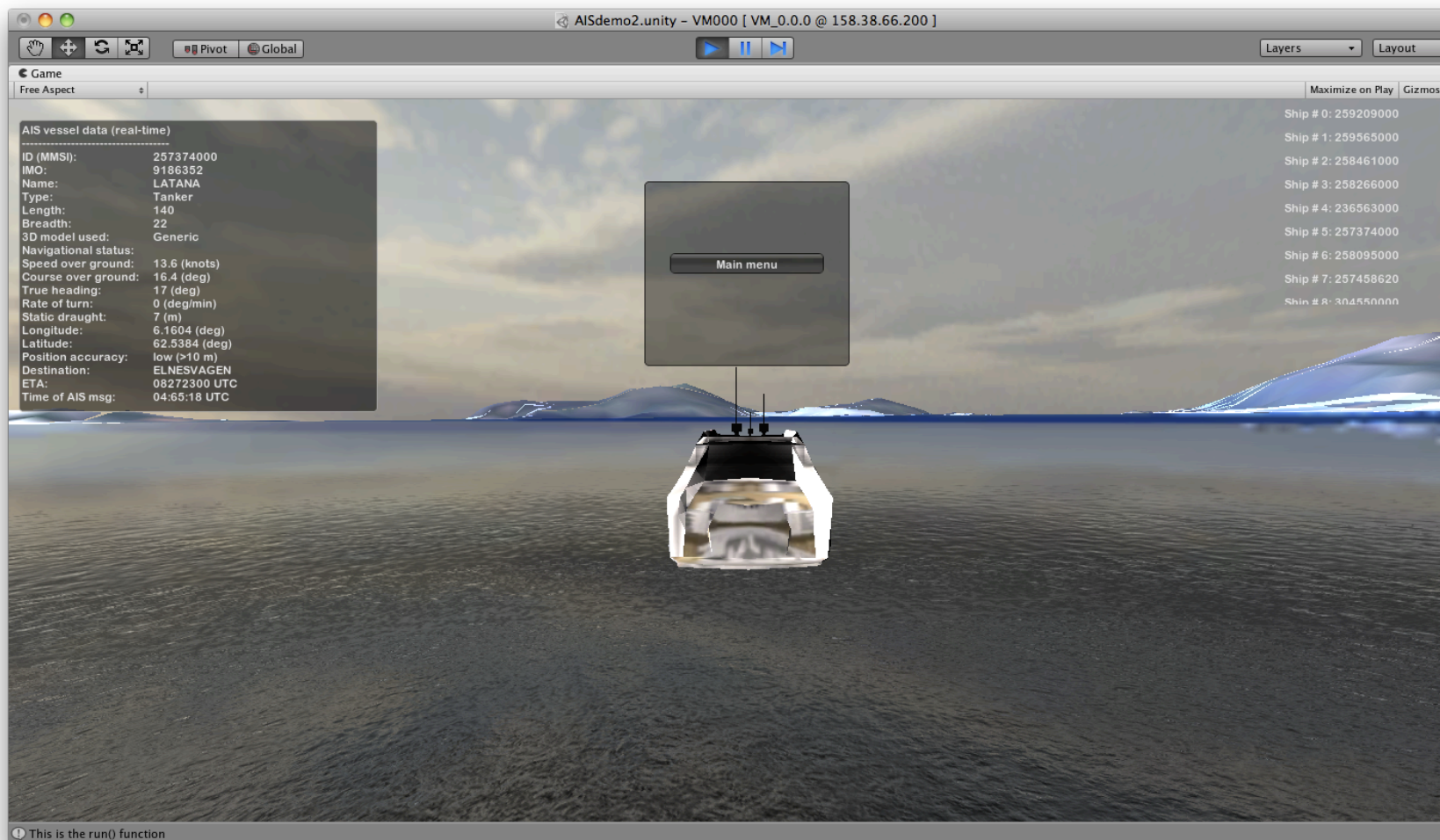
Tube tunnel in a Norwegian fjord

A car as and agents, carries a camera
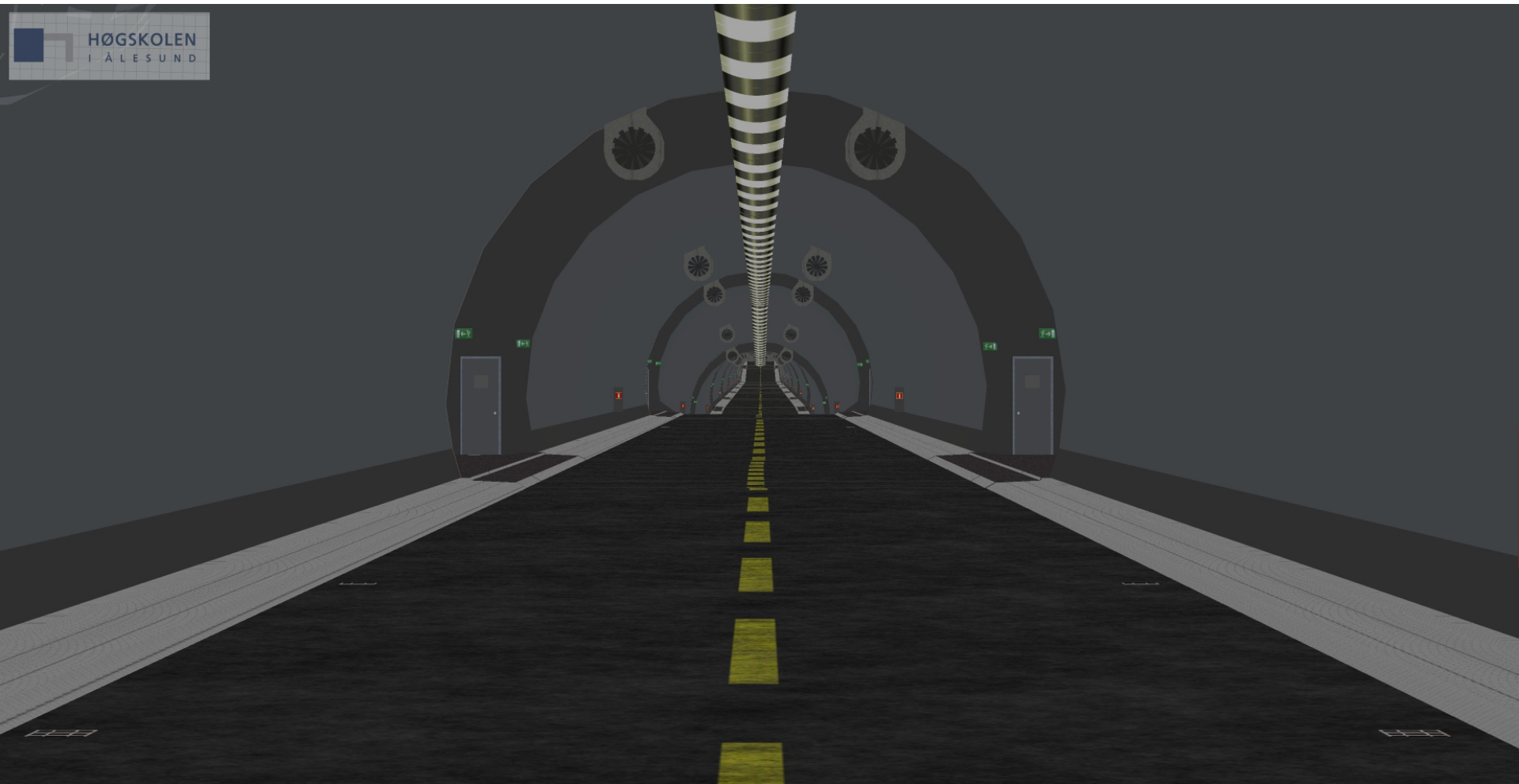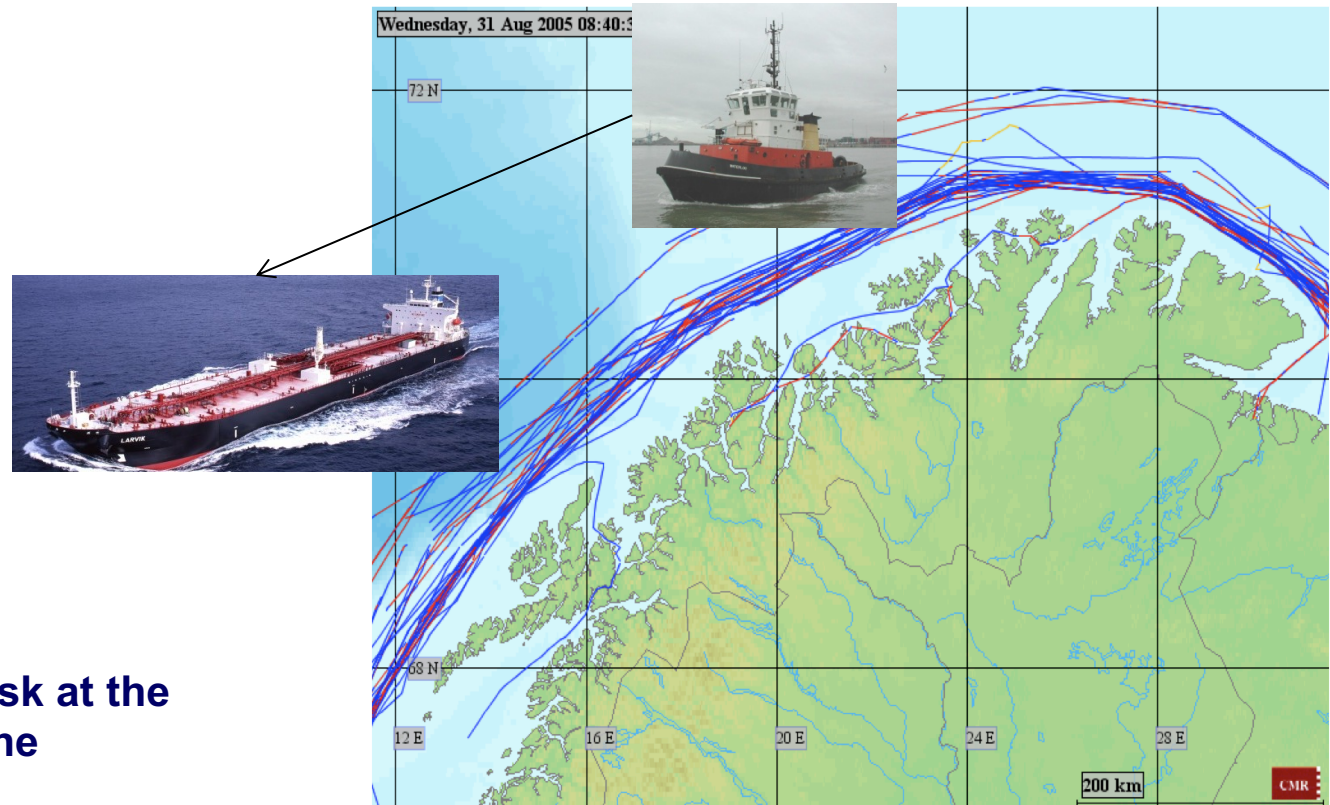
Landscape Norwegian fjords

Ship agents computer I real time

Optimum: speed, map road, energy, cost, and safety
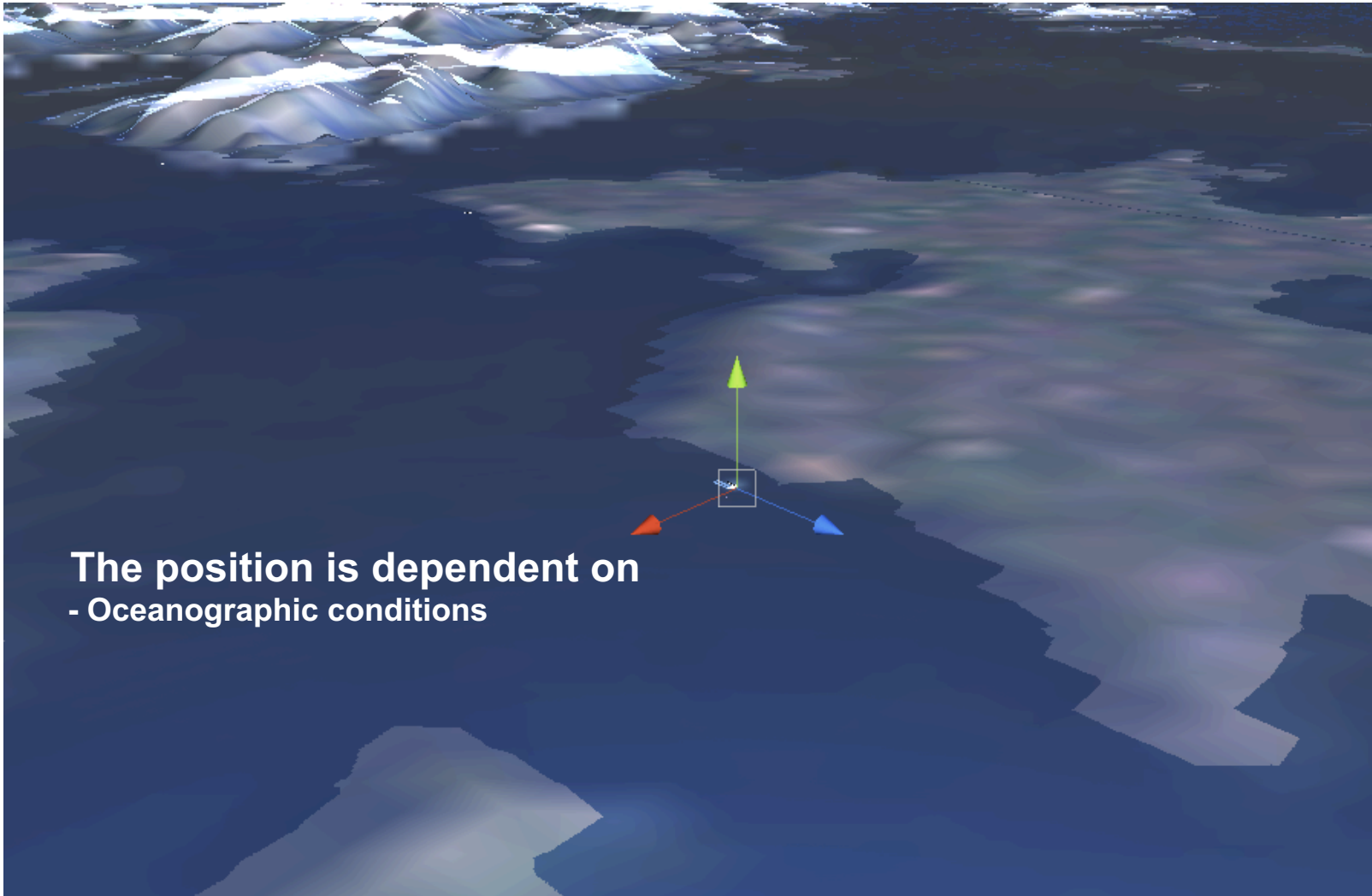
Tanker-Tug agents
Computes optimum Tug position
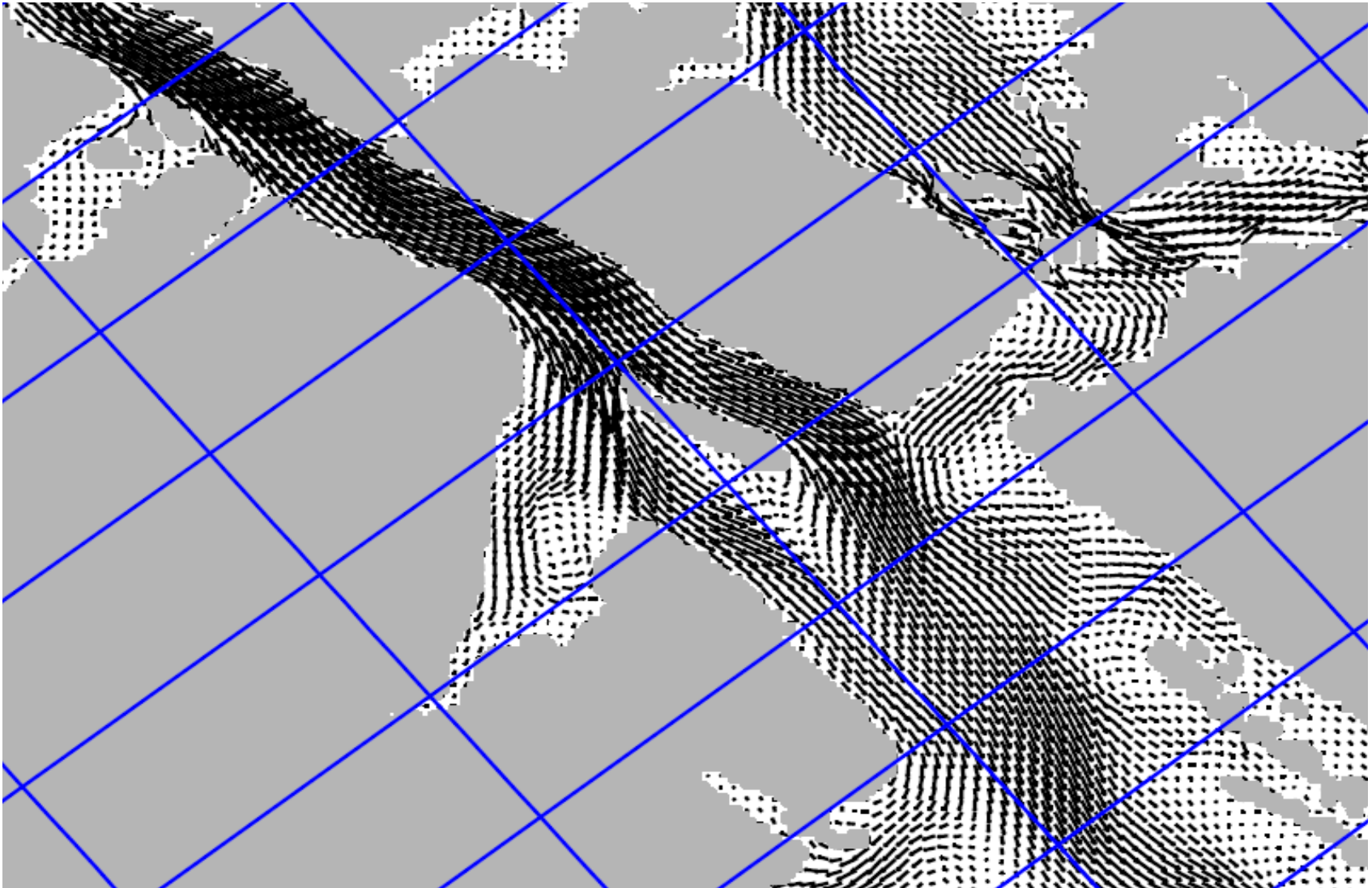

Oil tankers are a risk at the Norwegian coastline

Fish farm agents

Optimum fish farms position in a Norwegian fjord

The position is dependent on
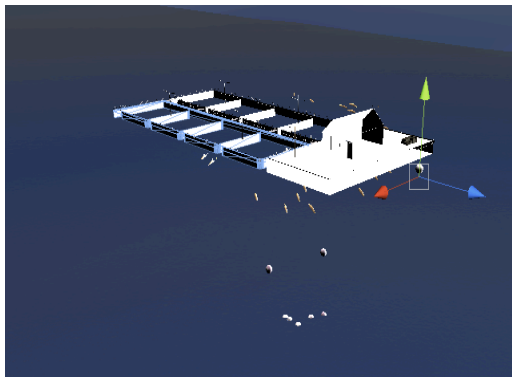**- Oceanographic conditions**

Ocean currents landscapes

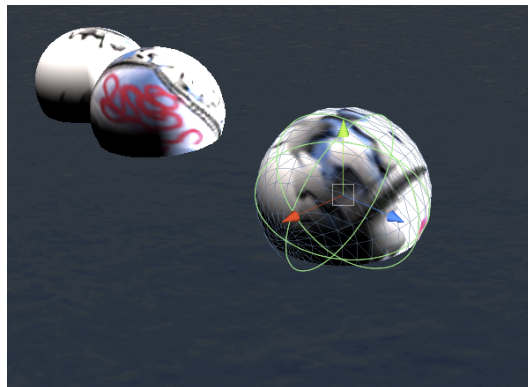Particle agents: Computes current patterns

Fish farm virus infection
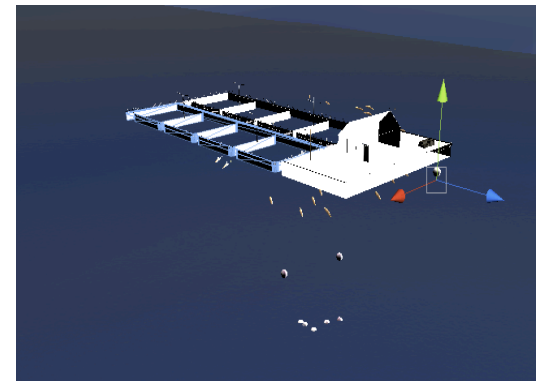
Agents as active virus swarms between Fish farms

Virus producer

Virus swarm
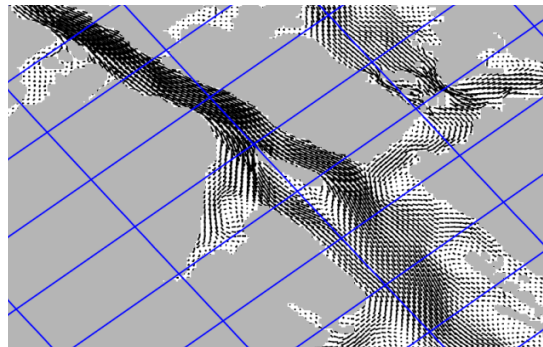
Virus consumer

Fjord current

Agents as problem solver

The System Architecture view

The System Dynamics view

Input landscapes

Oceanographic landscapes
Climate landscapes
Tide landscapes
Terrain landscapes

Input landscapes
Output landscapes
Input cost landscapes
Output cost landscapes

Thank you

More information?
You will find me, at the end of the rainbow

http://ansatte.hials.no/hy/