

Use of Augmented Reality in geosimulators



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in collaboration with Statoil

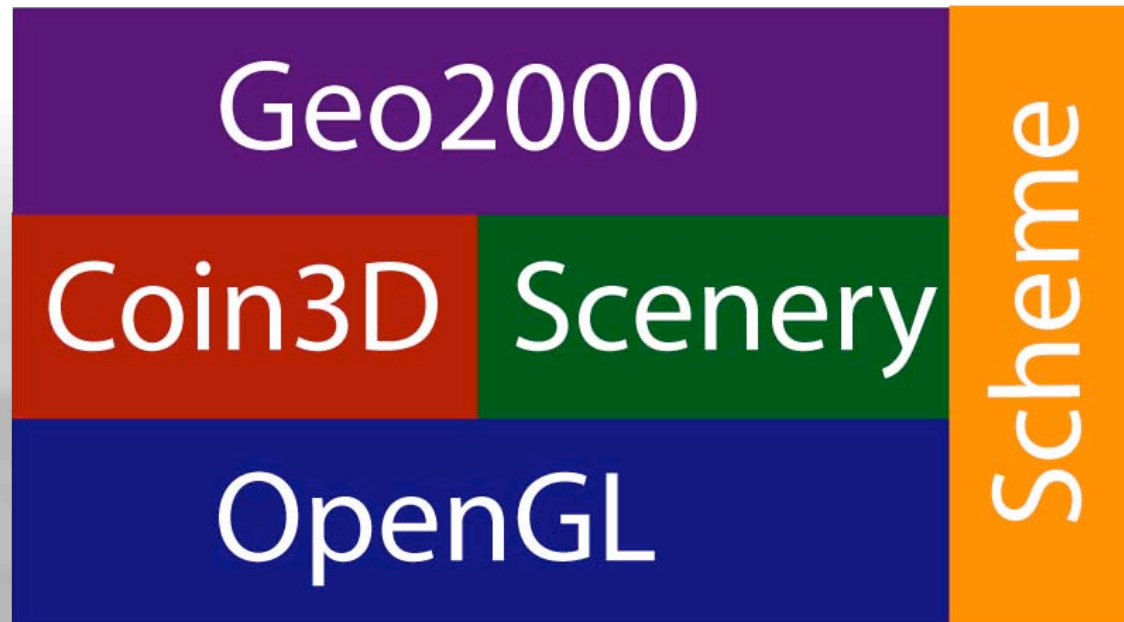
Motivation

It existed a geosimulator of Svalbard called SvalSim. This type of simulators contains geographical, geological and geophysical information placed in the terrain.

Goal: Adapt existing geosimulator SvalSim for use in field work and logistic support.

Software

- SvalSim as and other geosimulators in the Geo2000 project are built by the following modular parts:



Hardware

- Laptop running SvalSim
- Tracking:
 - GPS
 - GYRO
- Head Mounted Display (HMD)

Laptop (Rocky P4)



GPS

(position, elevation, speed & heading)



HMD



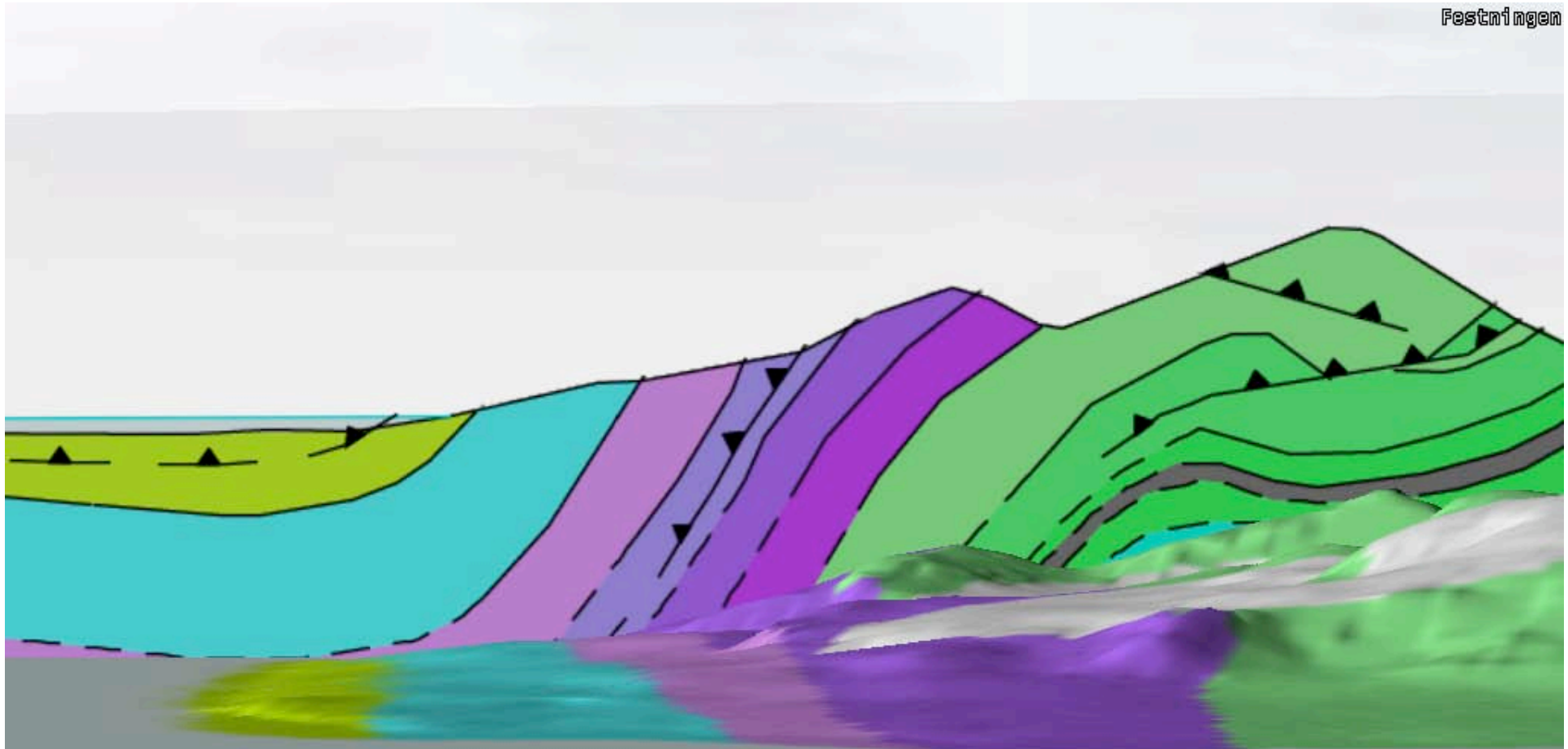
Gyro

(3D directions – pitch, roll, yaw)



Geological field work

- Traditional field based training:
Field observations using printed data/material
- Geosimulators contains a variety of information stored by coordinates in a virtual terrain model. Information can be retrieved by discovery (virtual travelling)
- With the use of a goggle a user can view both the real world and the virtual world at the same time.

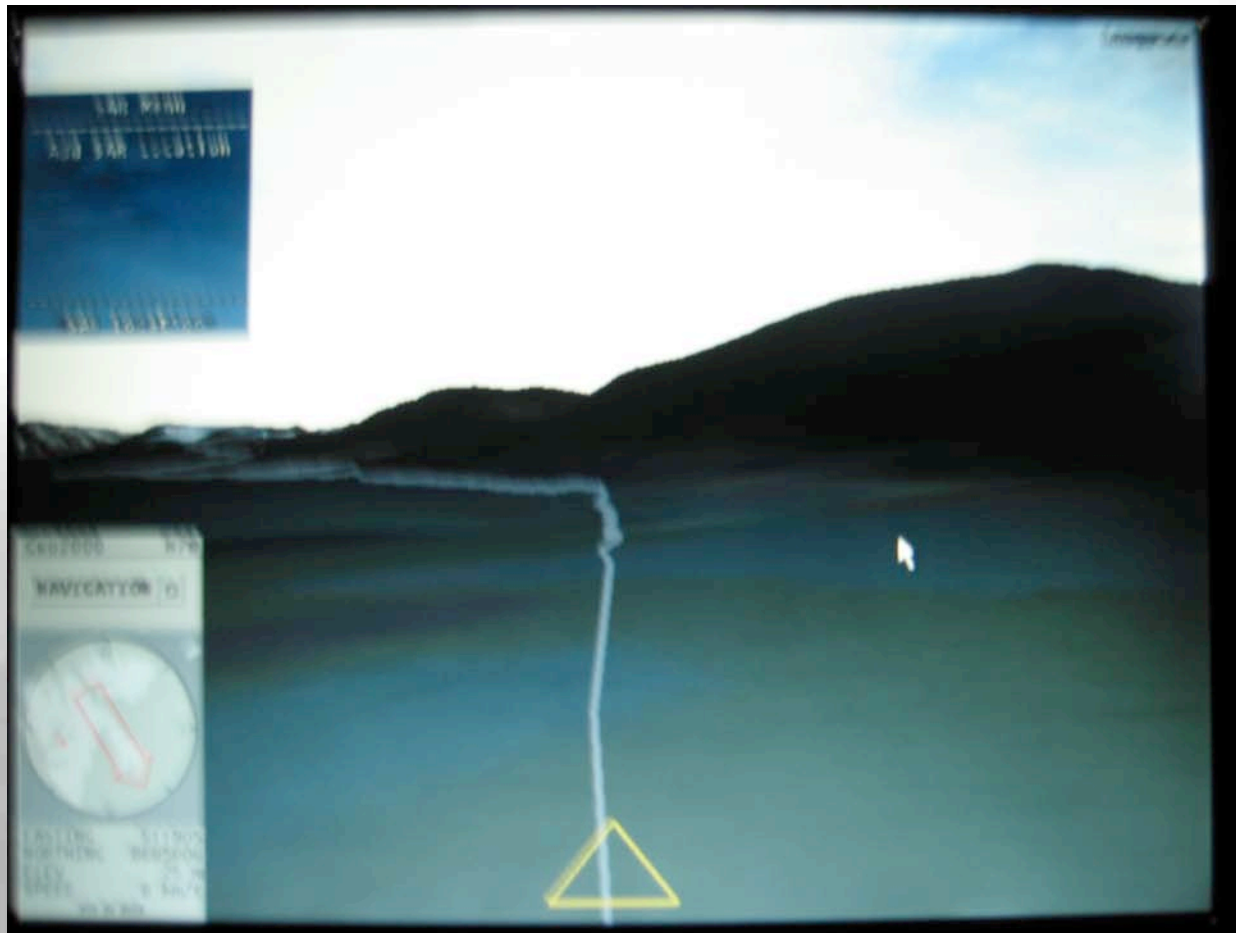


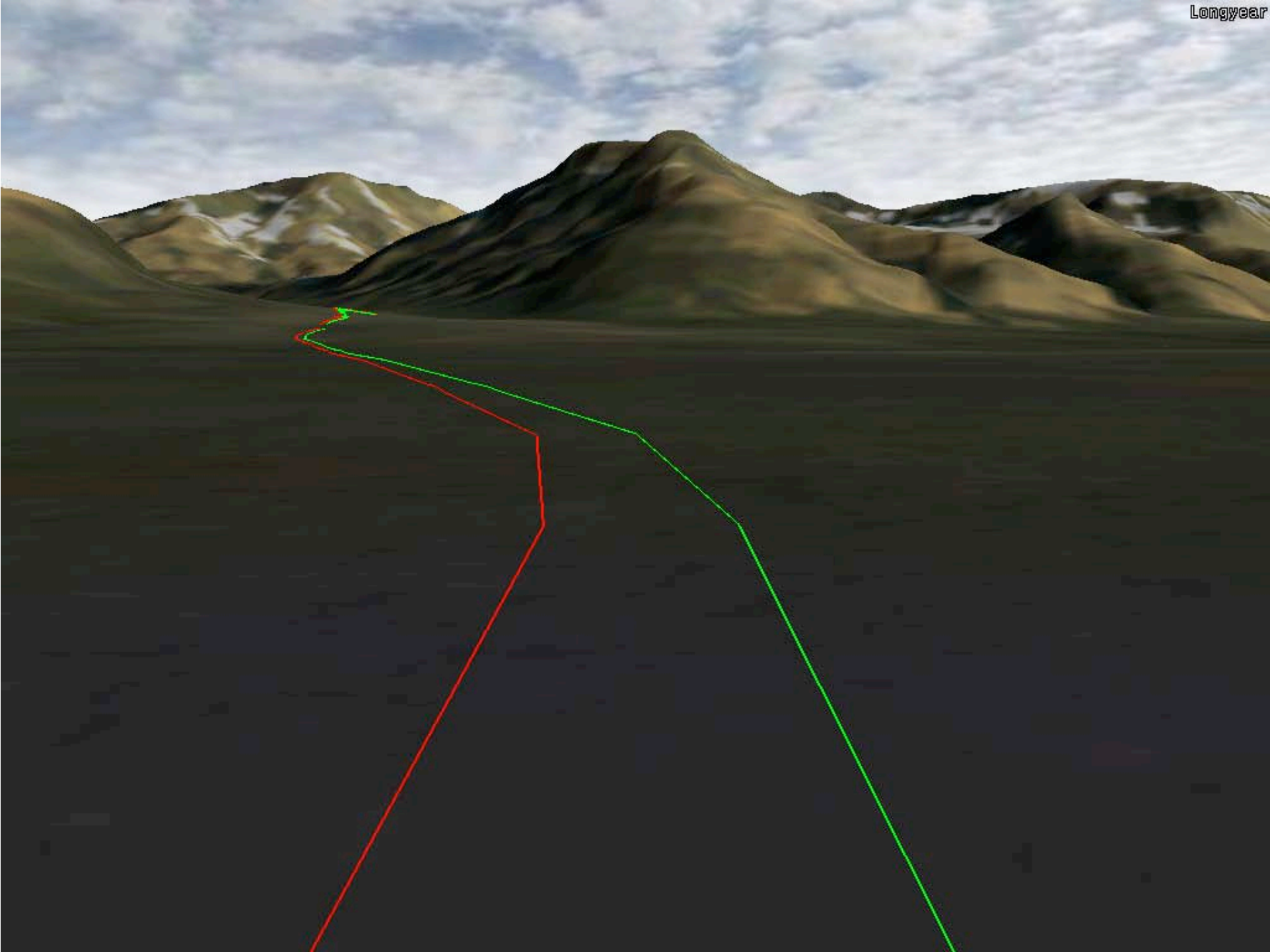
Geo2000 H7@

- RESOURCES
- Settings...
- Grav/Mag
- ArcticMap
- ✓Profiles
- Seismic
- Field diary
- Local...

Search And Rescue

- With car, snowmobile or belt-car





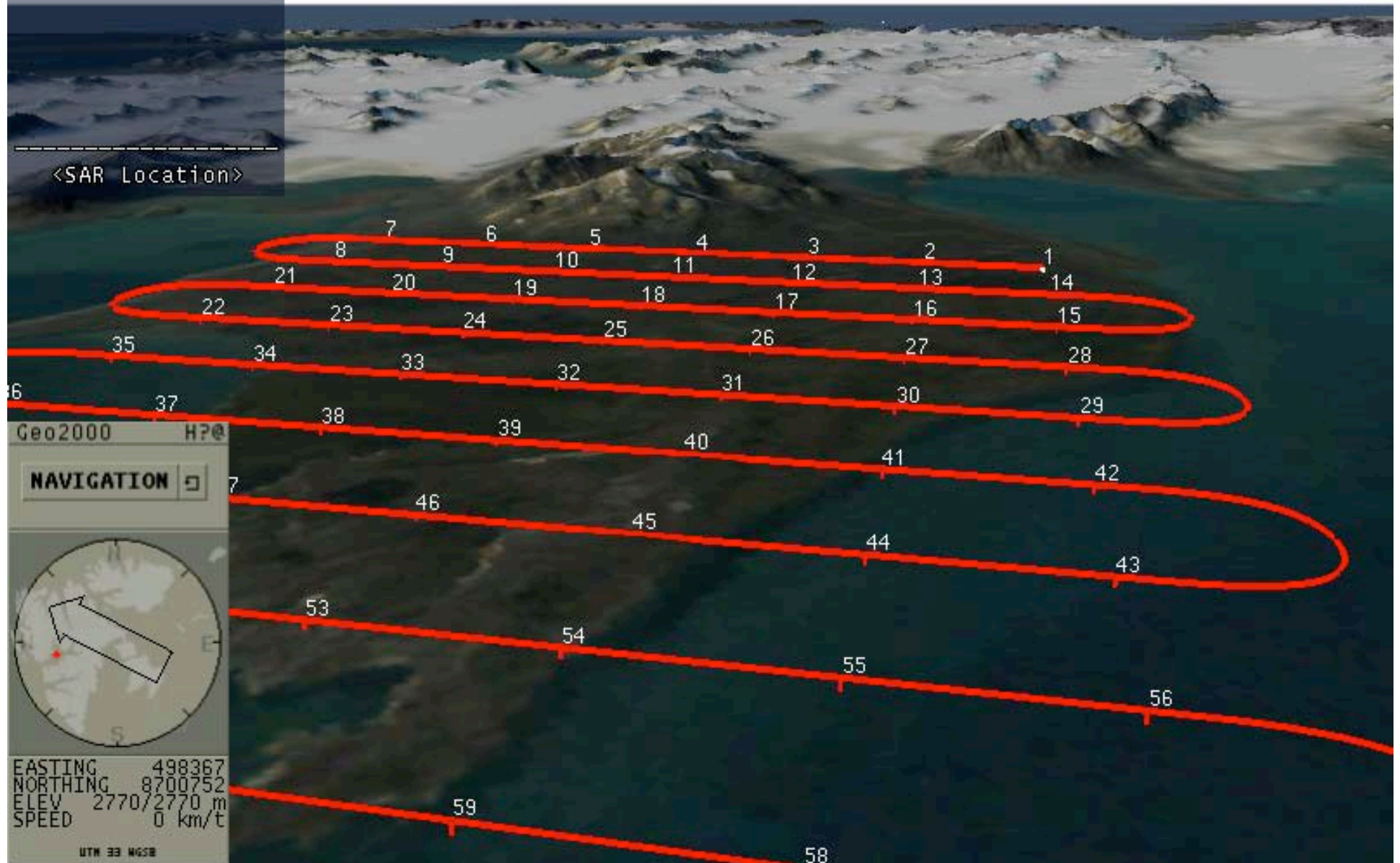
With helicopter



SAR Menu

Add SAR Location

<SAR Location>



Geo2000 H70

NAVIGATION



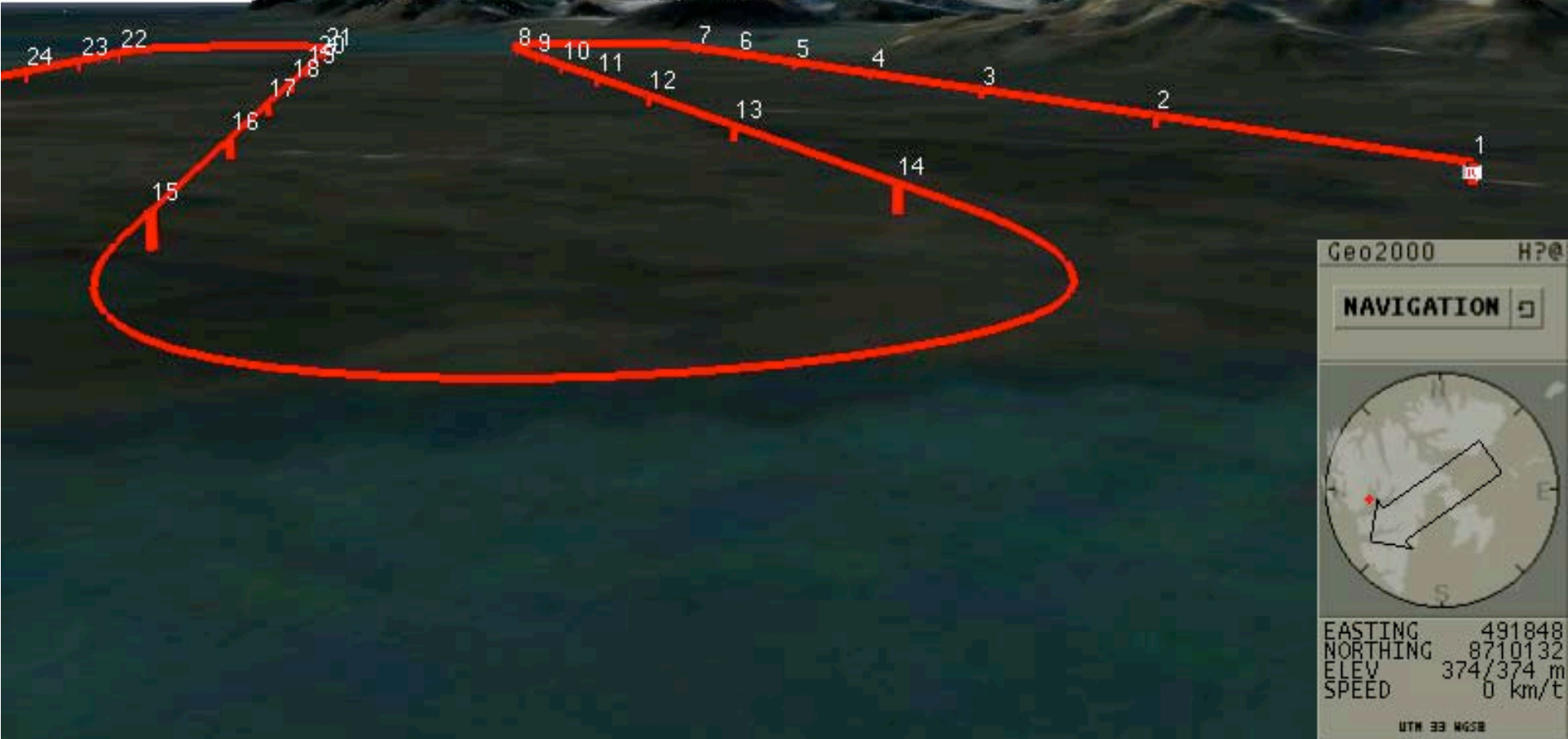
EASTING 498367
NORTHING 8700752
ELEV 2770/2770 m
SPEED 0 km/h

UTM 33 NGS

SAR Menu

Add SAR Location

<SAR Location>



Challenges

- Tracking accuracy:
 - Standard GPS accuracy is around 5 meters.
 - GYRO drifting due to magnetic noise.

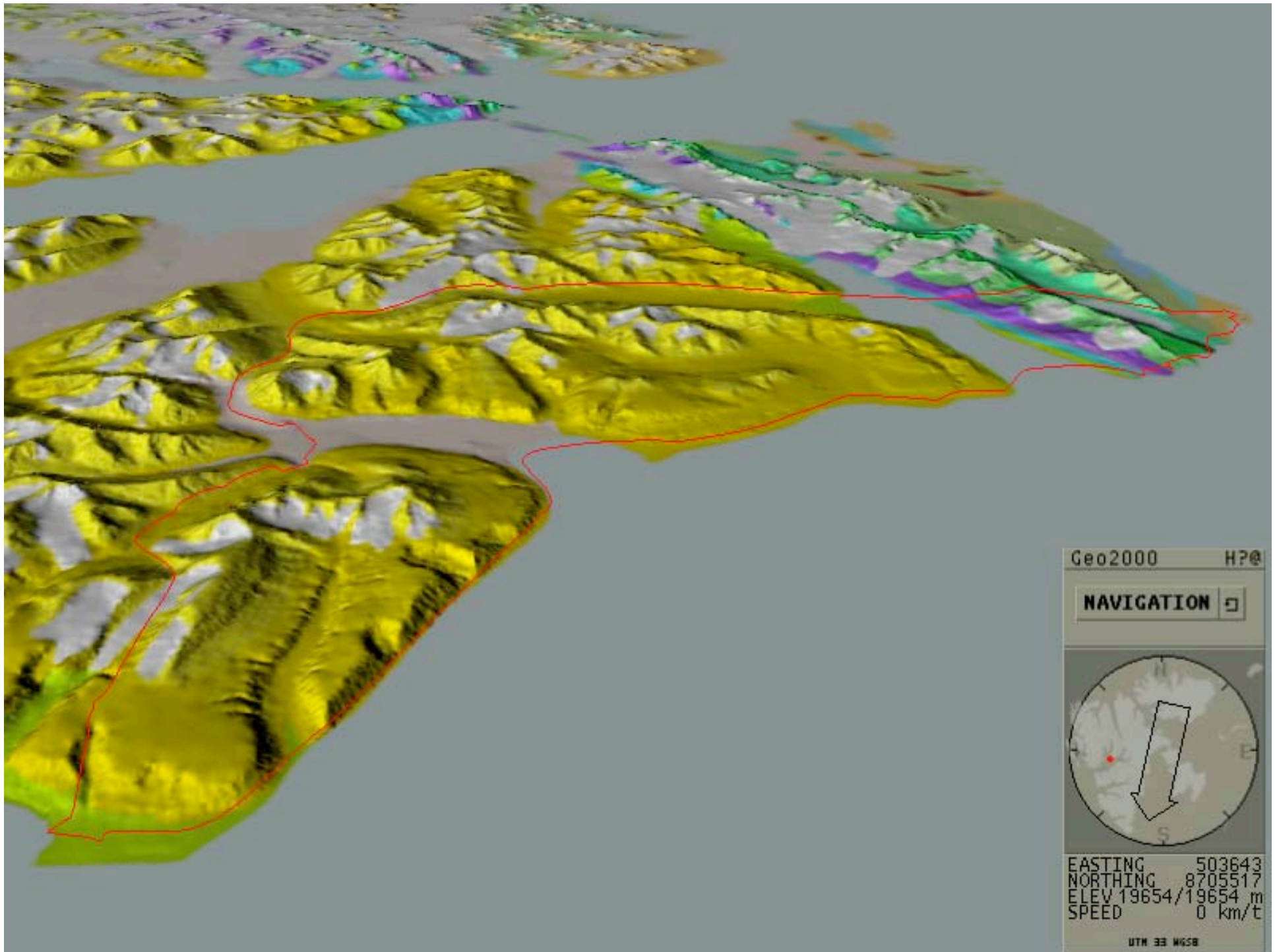
Currently we are using only GPS for tracking.

- Correct scaling of terrain to match users view.
- Robust equipment due to the rough environment.
It should be possible to operate it with gloves.

Further work

- Improve position estimation with extrapolation/filtering techniques (e.g Kalmann)
- Use of camera to improve augmentation and accuracy.
- Upgrade tracking equipment.
E.g Fiberoptic/Laser GYRO





Thanks to

- Statoil and Bjørn Sæther my supervisor.
Sindre Flatås, Statoil
- Systems In Motion
- The governor of Svalbard
- Airlift

- All pictures are copyright Geo2000,
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