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3D Geo-portal Visualization Software for Control Rooms in the Oil and Gas Industry using Python

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Off-shore operations in the oil and gas industry are becoming increasingly expensive and complex. One of the strategies to overcome this development is to create operation centers on-shore.

Centralizing the control of oil-fields allows field-managers to make optimal decisions in a global scale. However, the amount of information they must process increases dramatically.

We present the application Vispo3D Operations. Vispo3D Operations ties together information from various data sources and provide an overview of the current situation in the North Sea. The decision making is facilitated by providing 3D visualization for various aspects in oil-rig management, such as the simulation of the current weather conditions.

The application is implemented almost exclusively in Python. Due to the novel and challenging requirements of the project for both developers and customers, Python proved to be a valuable tool for Rapid Application Prototyping and more importantly for explorative development.

The original plan was to re-implement the whole solution in C++. However, the Python version proved to be sufficiently responsive and adequate, very flexible and especially adaptable with regards to the changing requirements.

Vispo3D Operations makes use of Kongsberg SIM's mature 3D visualization libraries and toolkits collectively named Coin3D. Coin3D is a high-level, retained-mode visualization suite for effective 3D graphics development, which is cross-platform, open source and without any royalties or run-time fees for professional licensees.

Consequently, Python bindings for Coin3D, called Pivy, were created to interface with the Coin3D C++ libraries. PyQt from Riverbank and Qt from Trolltech are used for the graphical user interface. CherryPy, a pythonic, object-oriented HTTP framework, is used for client server communication, as well as serving a web-interface for off-shore users. The data itself is stored in SQLite databases, which is fetched through XML-RPC from the clients.

The decision to use Python proved to be very rewarding and allowed us to cope with the changing and demanding requirements from the customer with ease. The successful usage of Python within this project convinced upper management to leverage the advantages and benefits of Python for further upcoming new projects.

Summary

Relevant URLs from the abstract:

Kongsberg SIM - http://www.sim.no/
Coin3D - http://www.coin3d.org/
Pivy - http://pivy.coin3d.org/

Primary authors: Mr SEEHUUS, Rolv (Kongsberg SIM); Mr FAHMY, Tamer (Kongsberg SIM)

Presenters: Mr SEEHUUS, Rolv (Kongsberg SIM); Mr FAHMY, Tamer (Kongsberg SIM)

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