tNavigator®

Rock Flow Dynamics

TECHNOLOGY OVERVIEW

Reservoir Modelling Software

tNavigator is a state-of-the-art reservoir modelling and simulation platform, offering a wide range of advanced innovative tools for geoscience, reservoir and production engineering disciplines.

Promoting cross domain collaboration, tNavigator is a single environment that enables subsurface teams to work together to navigate the reservoir and save time or data lost between moving between applications. In tNavigator, you will find unique workflows from geophysics to reservoir modelling, allowing geoscientists to construct a robust interpretation and reservoir model of their field. In the same interface, models can be instantly carried forward to simulation, well and surface network modelling, allowing for thorough analysis and evaluation of the field and more informed decision making.

https://rfdyn.com
tnavigator@rfdyn.com
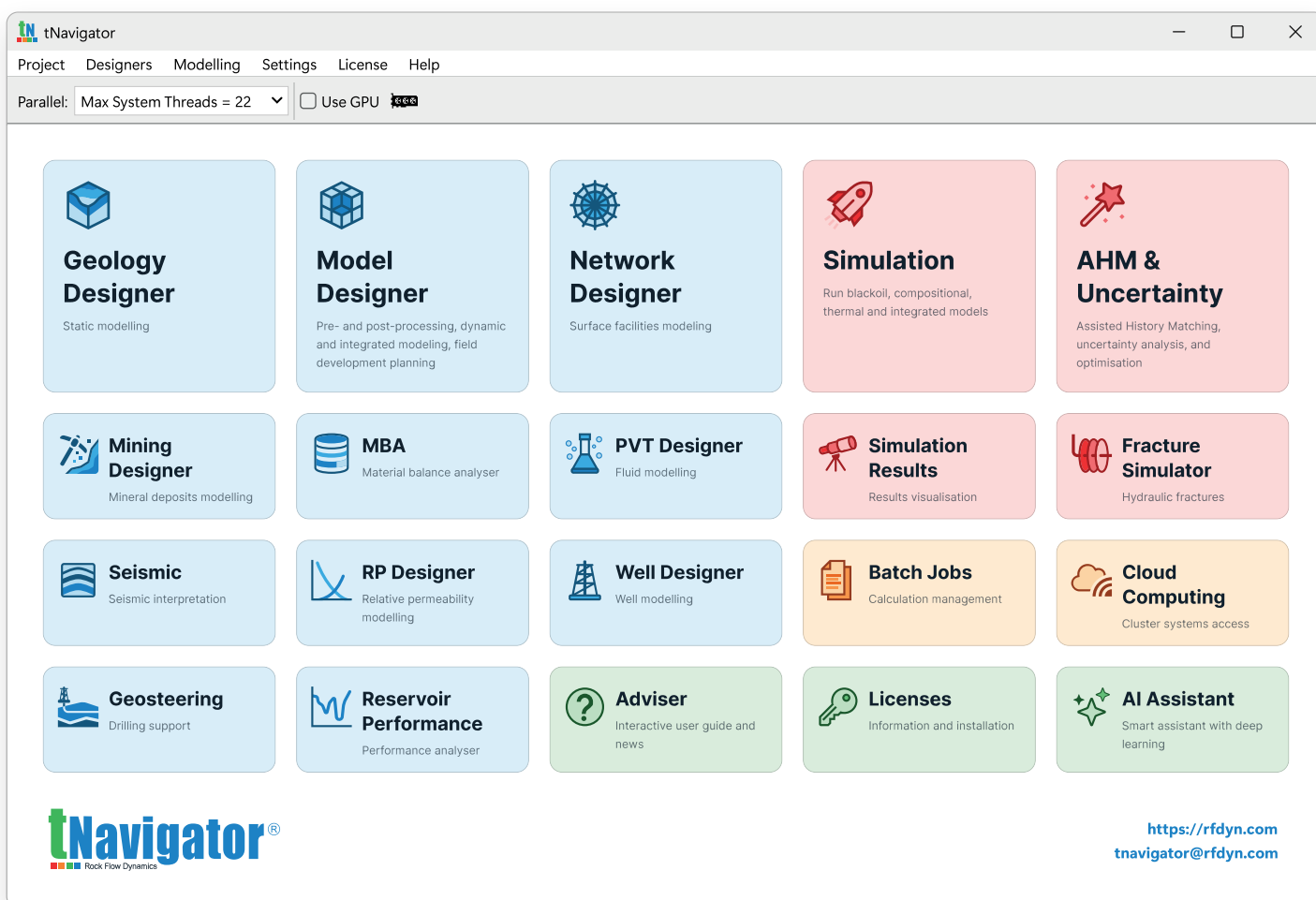
All-in-one solution - One Asset, One Software
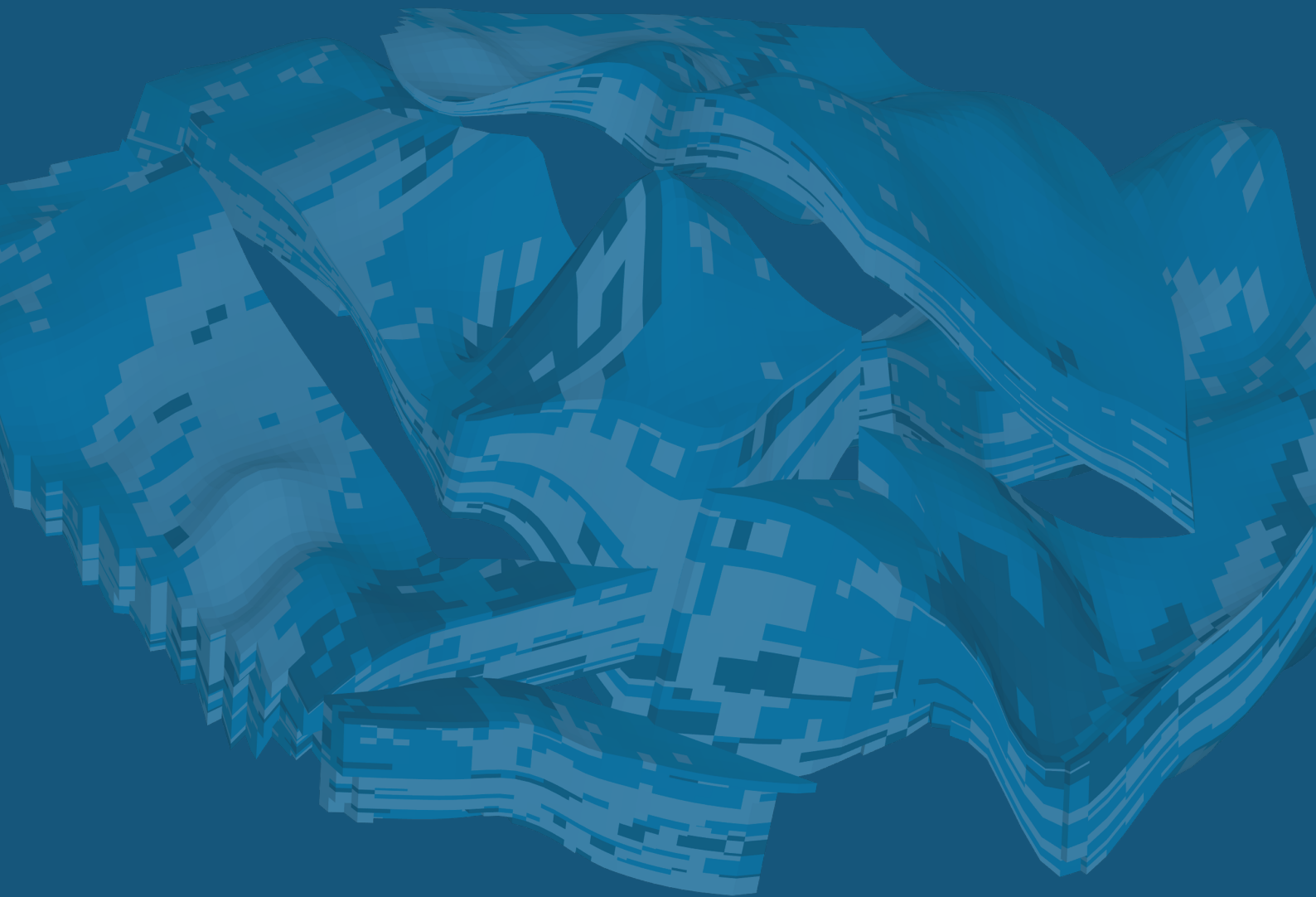
Fully integrated workflow from seismic to surface

All-in-one solution - One Asset, One Software

Seismic - visualise subsurface structures, interpret geological features, and guide reservoir characterisation

Geological interpretation, structural modelling, and reservoir characterisation

Simulation - built for speed dynamic modelling with hybrid CPU/GPU utilisation

Geomechanics - coupled well model, subsurface and surface integrity

Coupled subsurface-well-surface **network modelling**

Uncertainty, history matching and field development planning

◧ Seismic

Understanding subsurface conditions with precision is vital for geophysicists to make informed decisions in exploration and development. tNavigator's Seismic module offers advanced tools for analysing 2D, 3D and 4D seismic data at various scales, including seismic well tie, data visualisation, interpretation techniques and velocity model creation. A comprehensive library of attributes is available for improved interpretation and enhanced, reliable model building. These tools ensure a robust foundation for advanced analysis and improved decision-making.

◧ Geology Designer

Overcome the challenges associated with complex geological modelling, allowing you to undertake advanced analysis and testing of geological concepts to develop a robust subsurface model. Best in class static modelling technology to seamlessly QC, build, and optimise 3D geocellular grids. It supports advanced well log analysis, geological mapping, structural and unstructured grid creation, fault and fracture analysis, geomechanics, and advanced property interpolation, addressing a wide range of subsurface applications. Automated processes, intuitive tools, and innovative workflows streamline the creation of simulation-ready models.

◧ Mining Designer

Accurate and efficient geological modelling is crucial for mining professionals to understand deposits, optimise resource development, and support informed decision-making. tNavigator provides end-to-end geological modelling, combining geochemical, geophysical, core, and field data into a single intuitive interface. Creating detailed, data-driven models that honour source data while leveraging advanced geostatistical tools. With proprietary interpolation algorithms, machine learning techniques, and multivariate modelling tNavigator accelerates resource estimation, ranking, and development, enabling mining professionals to maximise efficiency and confidence in their operations.

◧ Geosteering

Efficient well drilling operations are essential for minimising risks, maximising reservoir penetration, and optimising productivity in complex subsurface environments. A comprehensive suite of tools to support every phase of well drilling, from planning to post-well reviews. It integrates real-time geological and technological data, enabling precise decision-making and enhanced operational efficiency for drilling and subsurface teams.
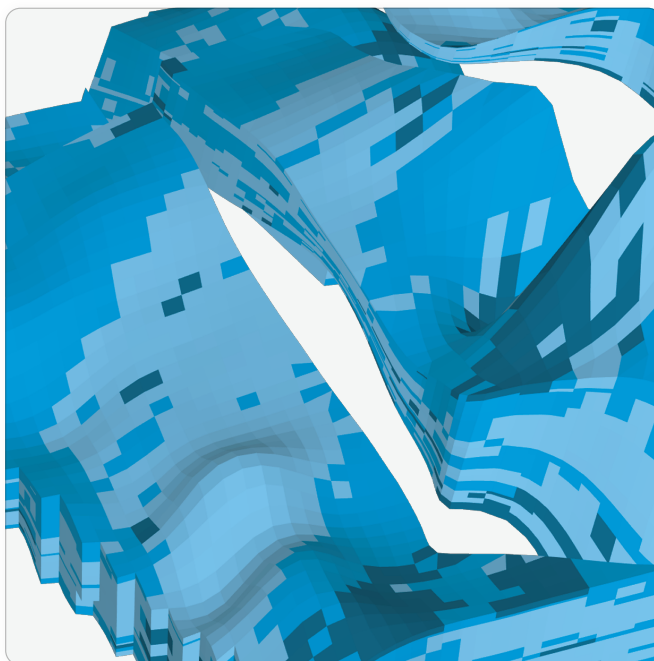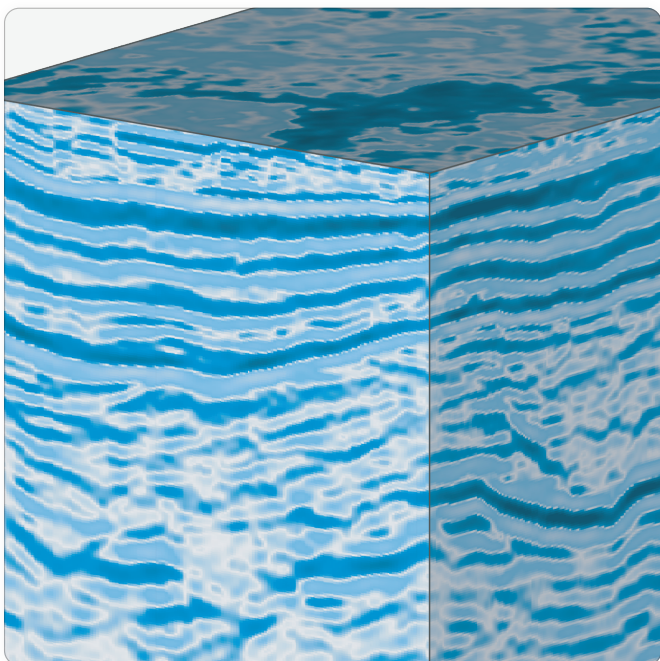
It's easy to jump between different domains when they're all in one software...
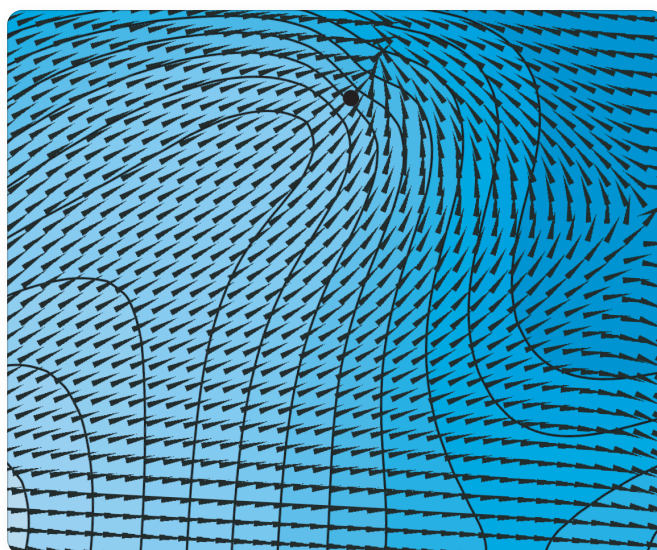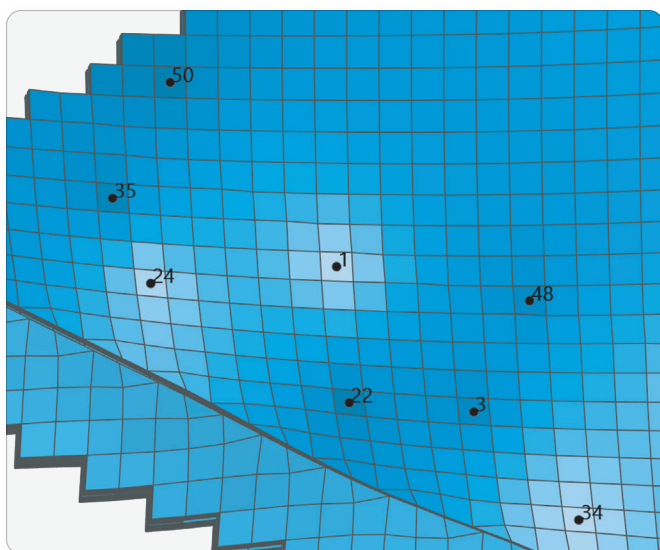
✦ Integrated AI

tNavigator offers a wide range of options for integrating cutting-edge artificial intelligence (AI), neural network (NN), and machine learning (ML) algorithms into seismic data processing, static modelling, and assisted history matching of dynamic field models.

Model Designer

Accurate fluid dynamic modelling is essential for optimising reservoir performance. Streamline the creation and updating of models, with a unified interface for pre and post processing, managing well events, running property calculations, and processing development history and well rules. Seamlessly integrated within tNavigator, it enables automated workflows, uncertainty quantification, and precise hydrodynamic modelling, for efficient model analysis and enhanced decision-making.

Geomechanics

Taking account of geomechanics ensures safe reservoir management by predicting rock deformation, optimal operating conditions, and potential fracturing risks. The technology calculates coupled geomechanical and filtration equations on a single grid, using fully implicit numerical methods and rock failure criteria. This enables precise forecasting of irreversible deformations, fracturing direction, deterioration of filtration capacity, and strategies to avoid infrastructure damage, ultimately preserving reservoir integrity and performance.

Material Balance Analyser

MBA streamlines reservoir analysis and forecasting using a simplified yet robust material balance approach. By employing proxy models, history matching, and integration with other tools, it allows efficient parameter evaluation and prediction. MBA facilitates the creation of single-block reservoir models, supports multi-reservoir flows, matches history data, performs short-term forecasting, and integrates seamlessly with other tNavigator modules. This comprehensive approach ensures improved accuracy and efficiency, enabling better decision-making and optimised reservoir development.

Relative Permeability Designer

Simplify the creation and optimisation of relative permeability and capillary pressure models for accurate reservoir simulations. By integrating measurement data, advanced modelling features, and visualisation tools with customisable settings for various reservoir conditions, it allows users to import SCAL data, create tailored RP curves, model hysteresis and advanced flow processes, and seamlessly export properties for simulation. This comprehensive approach streamlines workflows, delivering improved accuracy and efficiency in reservoir modelling.

Comprehensive Guidance

Access hundreds of user manuals and step-by-step training tutorials, or seek quick help with tNavigator's AI Assistant.

Fast and Agile Development

We have over 350 in-house developers, and release 4 major software updates per year. Development is strongly driven by the needs and wants of our users!

PVT Designer

Generate reliable reservoir forecasts from precise fluid property models for black oil, compositional, and thermal simulations. By leveraging experimental data, industry-standard correlations, and flexible modelling features such as component selection, lumping, and blending, it allows users to create phase envelopes, match experimental results, manage pseudo-components, and export PVT tables for simulation workflows. This integrated approach streamlines fluid characterisation, ensuring consistent, accurate representations of reservoir fluids, ultimately enhancing the quality and efficiency of reservoir modelling and decision-making.

Well Designer

Streamline well design and analysis by enabling accurate modelling and optimisation of production strategies. Incorporate advanced multiphase flow modelling, smart completions and corrosion rate evaluation tools. Optimise multisegmented wells, gas lift design, VFP table generation, and the simulation of smart completions. This comprehensive approach provides unmatched speed and flexibility for well and field development, resulting in more efficient and effective reservoir management.

Network Designer

Optimise surface network efficiency and field development by integrating reservoirs, wells, and facilities into a unified model. By offering advanced tools for pressure and temperature analysis, and fully implicit simulations of both reservoir and surface systems, it provides a unique single software approach to integrated asset modelling. PVT tables and well designs control full-field optimisation through steady-state calculations and dynamic coupling of connected reservoirs.

Reservoir Performance Analyser

Enhance production forecasting by benchmarking results across multiple modelling approaches. Easily import data from a full-field Model Designer project or directly from production spreadsheets. RPA's Decline Curve Analysis (DCA) enables interactive selection of historical production periods and applies various mathematical models to forecast future performance. Analyse individual wells or groups of wells, with interactive charts and visualizations that support efficient dynamic data analysis and seamless comparison.
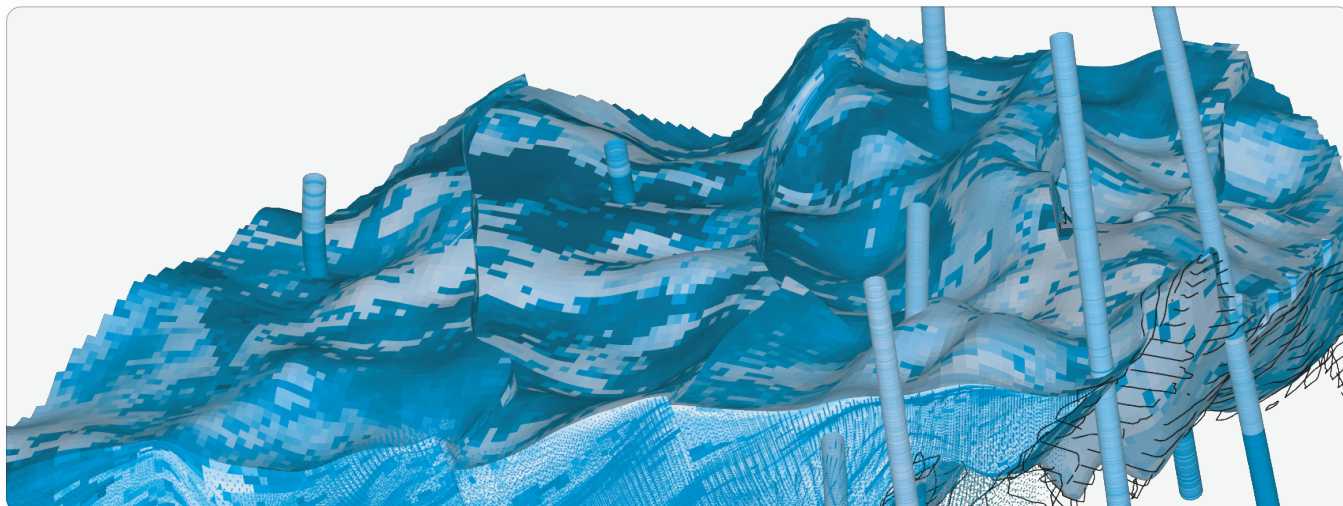
🚀 Simulation

The fastest, most scalable reservoir simulation technology in the energy industry. Universal fluid flow equations and robust physics-based models, enhanced by cutting-edge CPU+GPU computational technology. Simulation studies become so much easier due to the synchronised interface. Models can be paused at anytime step without the need to complete the full simulation before interacting with the field wells allowing for more control on history matching workflows.

Fracture Simulator

Reduce time and complexity in hydraulic fracturing modelling for improved production results, with seamless integration of static, dynamic, and geomechanical modelling on a unified grid. Fracture propagation simulation, flow analysis, flexible well and frac placement, and integration with assisted history matching and uncertainty workflows, ensuring robust optimisation across varied reservoir types.

AHM & Uncertainty

Evaluate risks and refine models with extensive uncertainty quantification, history matching, and forecast optimisation capabilities. By seamlessly integrating static and dynamic uncertainties and leveraging live result analysis, enable faster, more informed decision-making. A customisable dashboard, advanced algorithms, and machine learning tools elevate the reliability of field development strategies and enhance reservoir performance.
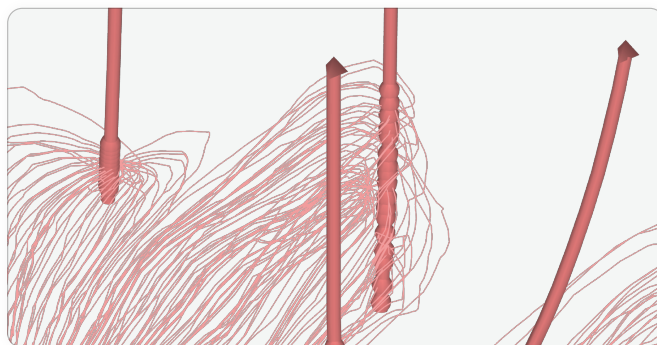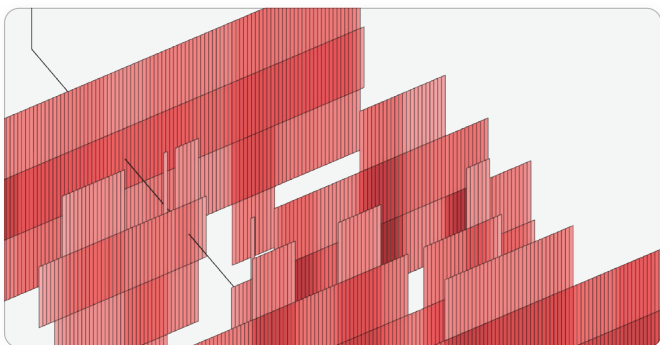
❓ Adviser

Adviser provides centralised access to all software documentation, including manuals, tutorials, and release notes, with a powerful global search function for easy navigation. While using tNavigator, users can quickly access calculation-specific documentation with one click. Stay informed about new features with release note slide packs and master the software through over two hundred tutorials covering workflows from seismic, geology, simulation, relative permeability, PVT design, fracture simulation, MBA, facility and well design, AHM, and uncertainty analysis.

✨ AI Assistant

The AI Assistant enhances user experience by providing contextual help, keyword definitions, and workflow guidance using natural language. Integrated into the GUI, it supports modules like Model Designer, Geology Designer and PVT Designer. Beyond basic assistance, it helps speed up model setup, troubleshoot errors, and guide users through complex tasks—making it especially valuable for newcomers and a productivity booster for experienced users navigating detailed reservoir workflows.

🖥️ Intuitive UI

The tNavigator user interface is intuitive and interactive, built to provide a seamless user experience.

🎧 24/7 Support

If you have any issues, questions, or suggestions, we have a 24/7 global support team with a rapid response time.
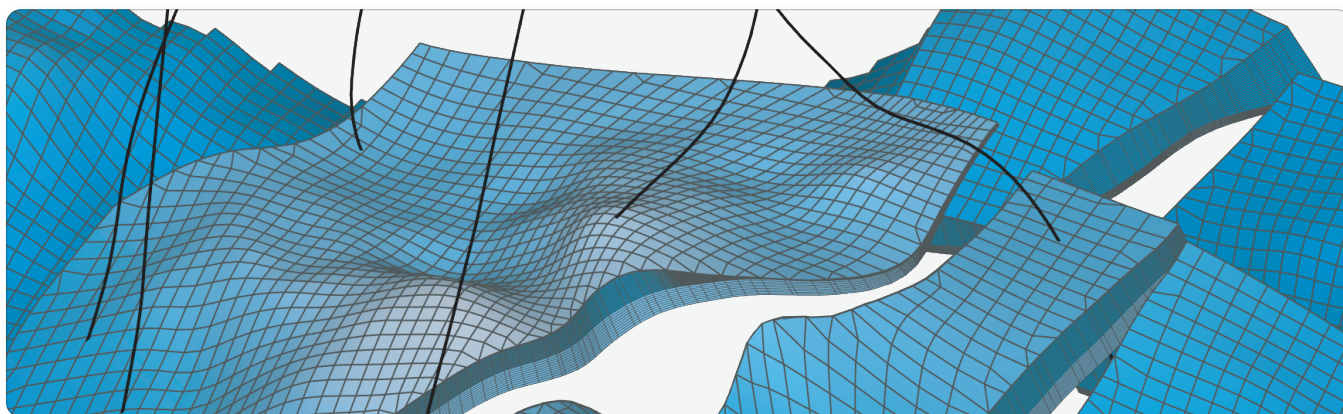
> 🔑 **Flexible Licensing**
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> ☁️ **Cloud Solutions**
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> Deployed on the vendor of your choice with on-demand and pay-as-you-go available for up to thousands of nodes.

Artificial Intelligence Integration

✦ AI, NN, and ML Algorithms

Optimise analysis and quantification of large datasets by leveraging the power of integrated Artificial Intelligence (AI), Machine Leaning (ML) and Neural Network (NN) technology inside tNavigator.

AI-enhanced optimisation and uncertainty analysis are available for both independent seismic, static, dynamic, and network models, as well as full-scale integrated field models.

The Seismic workflow utilises several AI/ML algorithms for advanced interpretation of seismic data. Multiple Linear Regression describes the curve representing a petrophysical parameter in wells as an arbitrary set of seismic attributes. With the help of neural networks, ML Seismic Inversion predicts the distribution of petrophysical properties in interwell space using seismic data and training wells. Waveform Clustering differentiates a seismic volume by variation in the shapes of seismic reflections within a given interval in order to group seismic signals into clusters.

When moving onto the static modelling workflow, absent log data can be predicted using the Random Forest ML algorithm, which is applied in classification, regression, and clustering. With this algorithm, there is no need to configure a multitude of calculation parameters. Existing well logs can be used to create discrete lithofacies logs in the wells with absent data by means of a log prediction calculation that employs fully connected neural networks. The calculation boasts a wide variety of settings to fine-tune the neural network, including its batch size, number of epochs, and layer size (the number of neurons in each layer).

State-of-the-art NN algorithms on the basis of Long Short-Term Memory (LSTM) architecture facilitate multivariant field modelling with surface network integration so that informed decisions are made in real time.

A Solution for All Energy Projects

🌿 Carbon Capture and Storage (CCS), Geothermal, Hydrogen & Wind

tNavigator provides a vital tool for CCS, offering advanced simulation of CO_2 injection, plume migration, and pressure changes, while ensuring safe containment through fault-seal and caprock integrity analysis. Its integrated modelling environment supports full lifecycle CCS project design, from storage site evaluation to long-term monitoring. For geothermal projects, tNavigator delivers high-precision reservoir simulations with thermal-hydraulic modelling, heat transfer analysis, and fractured system support—maximising energy recovery and efficiency. Hydrogen storage capabilities include modelling of subsurface behaviour and geomechanical stability. Wind applications focus on subsurface analysis to support turbine siting and reduce geological risk.

Embedded Python

🐍 Python API

The API provides a programmable interface to automate workflows, manipulate simulation models, run simulations, and extract or analyse results — all through Python. The Python API integrates seamlessly with existing data workflows, enabling direct interaction with production databases, real-time data streams, and analytics tools. It supports automated simulation runs, model updates, and custom processing using Python. This allows reservoir engineers and data teams to build dynamic, scalable workflows for forecasting, optimization, and continuous model calibration.

▫️ Digital Asset

By integrating real-time data, advanced analytics, and predictive modelling, this tool enables proactive, data-driven decisions across the asset lifecycle. The Python API acts as a key enabler, connecting models with live data streams, automating workflows, and supporting integration with dashboards and tools like Power BI for real-time visualization and insights.

Beyond Software

🎓 Training

Your tNavigator license includes access to our Client Portal, where you can find an extensive library of user manuals & step-by-step training tutorials to view freely. We are proud to offer a technology that is intuitive and easy to learn, however should you require a more in-depth introduction to maximise the potential of tNavigator within your teams, we provide high quality, bespoke training courses suited to your organisations needs. These can be delivered at your business location, at an off-site venue or online.

✅ Proof of Concept (PoC) Studies

We offer comprehensive services for proof of concept (PoC) studies, helping clients evaluate the feasibility and performance of reservoir simulation projects using tNavigator. Our experts demonstrate our software's capabilities in solving complex reservoir challenges, assisting in model setup, validation and performance assessment. These studies enable clients to assess potential value, optimise workflows, and make informed decisions before full-scale implementation.

✏️ Consultancy

Rock Flow Dynamics have a large network of in-house and external experts who can provide a wide range of technical geoscience, reservoir and petroleum engineering and advisory services to support projects within your organisation. Our consultancy expertise includes assisting clients with geological modelling/rebuilding, dynamic reservoir analysis, history matching & optimisation, and production forecasting. Our consultancy services are tailored to suit your business needs, offering flexible solutions with specialist skills from our team of friendly, professional experts.

▨ Model Conversion

With many software providers in the market, we understand that the process of converting existing models can be a drawback when switching to a new technology that better suits your needs. tNavigator supports most industry standard formats, and with our intuitive "plug & play" solution it's easy to bring your existing models into our interface. For more complex projects, we provide specialised model conversion services, enabling a seamless transition from third party platforms into tNavigator. Our experts ensure accurate data translation, model integrity, and validation throughout the conversion process. This service allows users to fully leverage tNavigator's advanced reservoir modelling and simulation capabilities while maintaining consistency with existing reservoir models and workflows.