COURSE OVERVIEW DE1074-3D

Seeing from Above: Remote Sensing & Photogrammetry

Course Title
Seeing from Above: Remote Sensing & Photogrammetry

Course Reference
DE1074-3D

Course Duration/Credits
Three days/1.8 CEUs/18 PDHs

Course Date/Venue

Session(s)	Date	Venue
1	May 11-13, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
2	August 11-13, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
3	October 19-21, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
4	December 15-17, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

This course is designed to provide participants with a detailed and up-to-date overview of Seeing from Above: Remote Sensing & Photogrammetry. It covers the sensor types and platforms and the principles of aerial photogrammetry; the image acquisition and preprocessing, image interpretation and data sources and acquisition methods; the image enhancement and transformation covering contrast enhancement and histogram stretching, band math, principal component analysis and tasseled cap transformation; and the image classification techniques, training sample selection and validation, machine learning approaches and post-classification smoothing and accuracy assessment.

During this interactive course, participants will learn the change detection and time-series analysis, structure from motion (SfM) photogrammetry and digital elevation models (DEM, DSM, DTM); the 3D modeling and visualization, integration with geographic information systems (GIS) and applications of remote sensing and photogrammetry; the UAV platforms and payload selection, RTK and PPK accuracy enhancement, data handling and post-processing; the ground truthing and GPS validation, confusion matrix and kappa statistics; the DEM vertical accuracy assessment and legal, ethical and policy considerations covering UAV regulations and airspace laws, data privacy and sensitive information, licensing and copyright of imagery and ethical issues in surveillance and monitoring.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain a comprehensive knowledge on remote sensing and photogrammetry
- Identify sensor types and platforms and discuss the principles of aerial photogrammetry
- Describe image acquisition and preprocessing and apply image interpretation and data sources and acquisition methods
- Carryout image enhancement and transformation covering contrast enhancement and histogram stretching, band math, principal component analysis and tasseled cap transformation
- Apply image classification techniques, training sample selection and validation, machine learning approaches and post-classification smoothing and accuracy assessment
- Illustrate change detection and time-series analysis, structure from motion (SfM) photogrammetry and digital elevation models (DEM, DSM, DTM)
- Carryout 3D modeling and visualization, integration with geographic information systems (GIS) and applications of remote sensing and photogrammetry
- Apply UAV platforms and payload selection, RTK and PPK accuracy enhancement, data handling and post-processing
- Employ ground truthing and GPS validation, discuss confusion matrix and kappa statistics and DEM vertical accuracy assessment
- Discuss legal, ethical and policy considerations covering UAV regulations and airspace laws, data privacy and sensitive information, licensing and copyright of imagery and ethical issues in surveillance and monitoring

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of seeing from above: remote sensing and photogrammetry for surveyors and mapping professionals, geospatial analysts and GIS specialists, urban planners and environmental scientists, civil engineers and infrastructure developers, disaster management and emergency response teams, forestry and agricultural experts and other technical staff.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **1.8 CEUs** (Continuing Education Units) or **18 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Dr. Chris Kapetan, PhD, MSc, is a **Senior Petroleum Engineer** with over **30 years** of international experience within the **onshore** and **offshore oil** & **gas** industry. His wide experience covers **Asset Management** Principles, Risks & Economics, **Petroleum Economics**, **Decision Analytic Modelling Methods** for **Economic Evaluation**, **Probabilistic Risk Analysis** (**Monte Carlo Simulator**) **Risk Analysis Foundations**, **Global Oil Demand**, Crude Oil Market, Global Oil Reserves, Oil Supply & Demand, Governmental Legislation, Contractual Agreements, **Financial** Modeling, **Oil Contracts**, **Project Risk Analysis**, **Feasibility Analysis** Techniques, **Capital Operational Costs**, Oil & Gas Exploration Methods, **Reservoir** Evaluation, **Extraction of Oil & Gas**, **Crude** Oil Types & Specifications, Sulphur, Sour Natural Gas, **Natural Gas Sweeting**, **Petroleum Production**, Field Layout, **Production** Techniques & Control, **Surface Production** Operations, **Oil Processing**, Oil Transportation-Methods, **Flowmetering & Custody Transfer** and **Oil Refinery**. Further, he is also well-versed in Enhanced Oil Recovery (**EOR**), Electrical Submersible Pumps (**ESP**), **Oil Industries Orientation**, **Geophysics**, Cased Hole **Formation Evaluation**, Cased Hole **Applications**, Cased Hole **Logs**, Production **Operations**, Production **Management**, Perforating **Methods & Design**, Perforating **Operations**, **Fishing** Operations, **Well & Reservoir** Testing, **Reservoir Stimulation**, **Hydraulic Fracturing**, **Carbonate** Acidizing, **Sandstone** Acidizing, **Drilling Fluids Technology**, Drilling **Operations**, **Directional** Drilling, **Artificial Lift**, **Gas Lift Design**, **Gas Lift Operations**, **Petroleum Business**, **Field Development Planning**, **Gas Lift Valve** Changing & Installation, **Well Completion** Design & Operation, Well **Surveillance**, Well **Testing**, Well **Stimulation** & **Control** and **Workover Planning**, **Completions** & **Workover**, **Rig Sizing**, **Hole Cleaning** & **Logging**, **Well Completion**, **Servicing** and **Work-Over Operations**, Practical **Reservoir Engineering**, **X-mas Tree & Wellhead** Operations, Maintenance & Testing, **Advanced Petrophysics/Interpretation** of **Well Composite**, **Construction Integrity** & **Completion**, **Coiled Tubing Technology**, **Corrosion Control**, **Slickline**, **Wireline & Coil Tubing**, **Pipeline Pigging**, **Corrosion Monitoring**, **Cathodic Protection** as well as Root Cause Analysis (**RCA**), Root Cause Failure Analysis (**RCFA**), **Gas Conditioning & Process Technology**, **Production Safety** and **Delusion of Asphalt**. Currently, he is the **Operations Consultant** & the **Technical Advisor** at **GEOTECH** and an independent **Drilling Operations Consultant** of various engineering services providers to the international clients as he offers his expertise in many areas of the **drilling & petroleum discipline** and is well **recognized & respected** for his process and procedural expertise as well as ongoing participation, interest and experience in continuing to promote technology to producers around the world.

Throughout his long career life, Dr. Chris has worked for many international companies and has spent several years **managing** technically **complex wellbore interventions** in both **drilling** & **servicing**. He is a **well-regarded** for his **process** and **procedural expertise**. Further, he was the **Operations Manager** at **ETP Crude Oil Pipeline Services** where he was fully responsible for optimum operations of crude oil pipeline, **workover** and **directional drilling**, **drilling rigs** and equipment, drilling of various geothermal deep wells and **exploration wells**. Dr. Chris was the **Drilling** & **Workover Manager** & **Superintendent** for **Kavala Oil** wherein he was responsible for supervision of **drilling operations** and **offshore exploration**, quality control of performance of **rigs**, **coiled tubing**, crude oil transportation via pipeline and abandonment of **well** as per the API requirements. He had occupied various key positions as the **Drilling Operations Consultant**, **Site Manager**, **Branch Manager**, **Senior Drilling** & **Workover Manager** & **Engineer** and **Drilling** & **Workover Engineer**, **Operations Consultant**, **Technical Advisor** in several petroleum companies responsible mainly on an **offshore** sour oil field (under water flood and gas lift) and a gas field. Further, Dr. Chris has been a **Professor** of the **Oil Technology College**.

Dr. Chris has **PhD** in **Reservoir Engineering** and a **Master's** degree in **Drilling & Production Engineering** from the **Petrol-Gaze Din Ploiesti University**. Further, he is a **Certified Surfaced BOP Stack Supervisor** of **IWCF**, a **Certified Instructor/Trainer**, a **Certified Trainer/Assessor/Internal Verifier** by the **Institute of Leadership & Management** (**ILM**) and has conducted **numerous short courses**, **seminars** and **workshops** and has published several technical books on **Production Logging**, **Safety Drilling Rigs** and **Oil Reservoir**.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Fee

US$ 5,250 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction & Remote Sensing*** *Definition, Evolution & Importance • Passive versus Active Sensing Systems • Applications Across Industries (Agriculture, Mining, Oil & Gas, Disaster Response) • The Electromagnetic Spectrum & Sensor Interaction*
0930 – 0945	*Break*
0945 - 1030	***Sensor Types & Platforms*** *Satellite-Based Sensors (Landsat, Sentinel, WorldView) • Airborne Systems & UAVs • Optical, Radar & Thermal Sensors • Resolution Types: Spatial, Spectral, Radiometric & Temporal*
1030 – 1130	***Principles of Aerial Photogrammetry*** *Differences Between Photogrammetry & Remote Sensing • Perspective Geometry & Parallax • Central Projection & Scale • Advantages of Photogrammetry for Terrain Modeling*
1130 – 1215	***Image Acquisition & Preprocessing*** *Mission Planning & Flight Line Design • Ground Control Points (GCPs) & Georeferencing • Radiometric & Geometric Corrections • Orthorectification & Mosaicking*

1215 – 1230	*Break*
1230 – 1330	***Fundamentals of Image Interpretation*** *Elements of Visual Interpretation (Tone, Shape, Texture, Pattern) • Spectral Signatures & Land Cover Differentiation • Manual versus Automated Interpretation • False-Color Composites & Band Combinations*
1330 – 1420	***Data Sources & Acquisition Methods*** *Open Data Platforms (USGS Earth Explorer, Copernicus Open Hub) • Commercial Datasets & Licensing • UAV Image Acquisition Protocols • Image Metadata & Quality Checks*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Image Enhancement & Transformation*** *Contrast Enhancement & Histogram Stretching • Band Math (NDVI, NDWI, SAVI) • Principal Component Analysis (PCA) • Tasseled Cap Transformation*
0830 – 0930	***Image Classification Techniques*** *Supervised versus Unsupervised Classification • Training Sample Selection & Validation • Machine Learning Approaches (Random Forest, SVM, KNN) • Post-Classification Smoothing & Accuracy Assessment*
0930 – 0945	*Break*
0945 – 1100	***Change Detection & Time-Series Analysis*** *Preprocessing for Temporal Consistency • Pixel-Based versus Object-Based Change Detection • Image Differencing & Post-Classification Comparison • Time-Series Vegetation or Urban Expansion Analysis*
1100 – 1215	***Structure from Motion (SfM) Photogrammetry*** *Image Overlap & Camera Calibration • Point Cloud Generation from 2D Images • Tie Point Matching & Bundle Adjustment • Dense Point Cloud Densification*
1215 – 1230	*Break*
1230 – 1330	***Digital Elevation Models (DEM, DSM, DTM)*** *Definitions & Differences • Generating Elevation Models from Stereo Pairs • Editing & Filtering Point Clouds • Applications in Hydrology, Engineering & Planning*
1330 – 1420	***3D Modeling & Visualization*** *Surface Mesh & Textured Models • 3D Navigation & Fly-Through Creation • Tools: Agisoft Metashape, Pix4D, OpenDroneMap • Export Formats & GIS/AutoCAD Integration*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

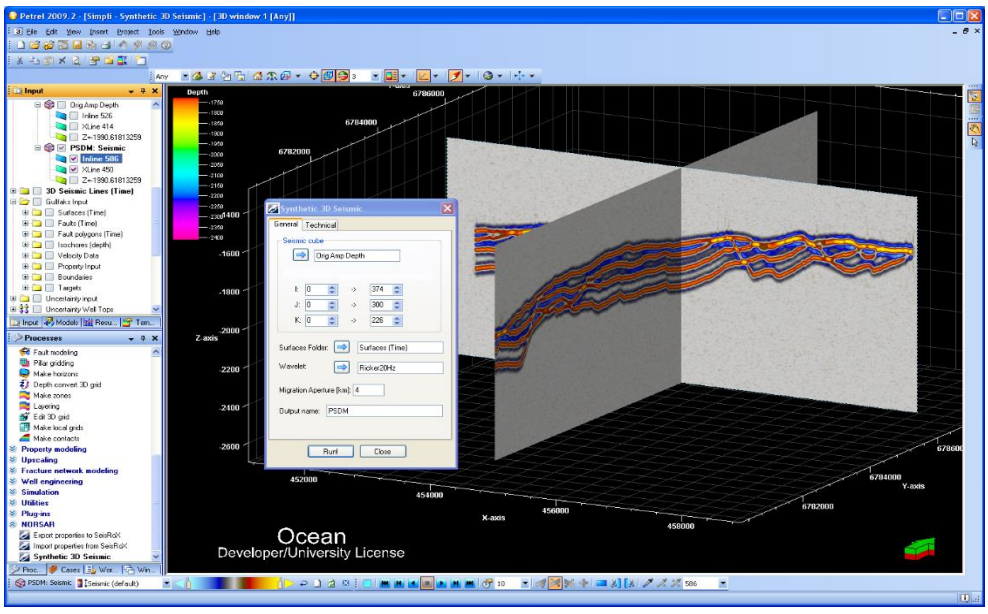
Day 3

0730 – 0830	***Integration & Geographic Information Systems (GIS)*** *Importing Imagery & Photogrammetry Outputs & GIS • Coordinate Systems & Spatial Referencing • Raster-Vector Data Integration • Spatial Analysis Using Classified Images*

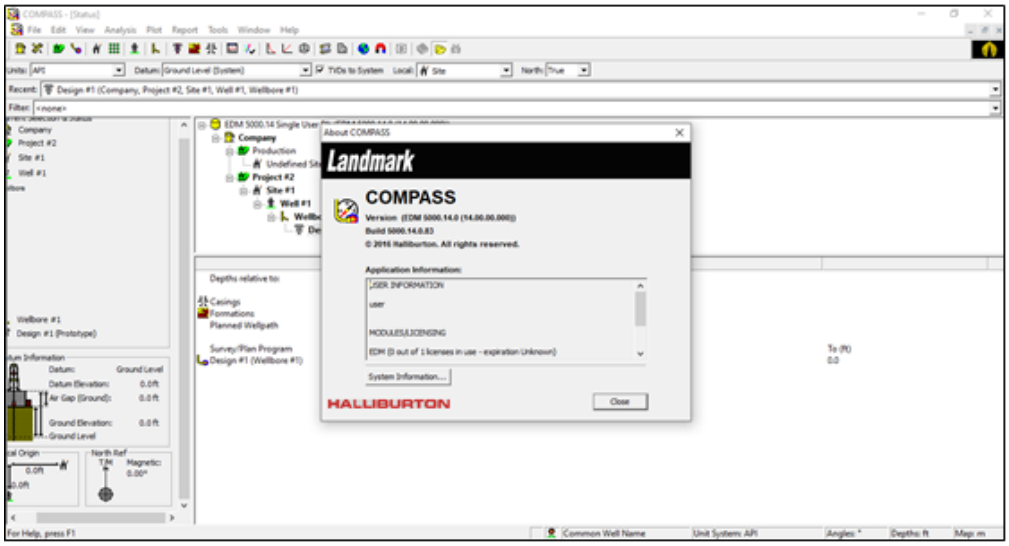
0830 – 0930	***Applications of Remote Sensing & Photogrammetry*** *Land Use/Land Cover (LULC) Mapping • Disaster Monitoring & Damage Assessment • Agriculture & Vegetation Health Monitoring • Urban Development & Infrastructure Planning*
0930 – 0945	*Break*
0945 – 1100	***UAV (Drone) Mapping & Field Practices*** *UAV Platforms & Payload Selection • Pre-Flight Planning & Software Tools • RTK & PPK Accuracy Enhancement • Data Handling & Post-Processing*
1100 – 1215	***Accuracy Assessment & Quality Control*** *Ground Truthing & GPS Validation • Confusion Matrix & Kappa Statistics • DEM Vertical Accuracy Assessment • Common Photogrammetric Errors & Mitigation*
1215 – 1230	*Break*
1230 – 1345	***Legal, Ethical & Policy Considerations*** *UAV Regulations & Airspace Laws • Data Privacy & Sensitive Information • Licensing & Copyright of Imagery • Ethical Issues in Surveillance & Monitoring*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

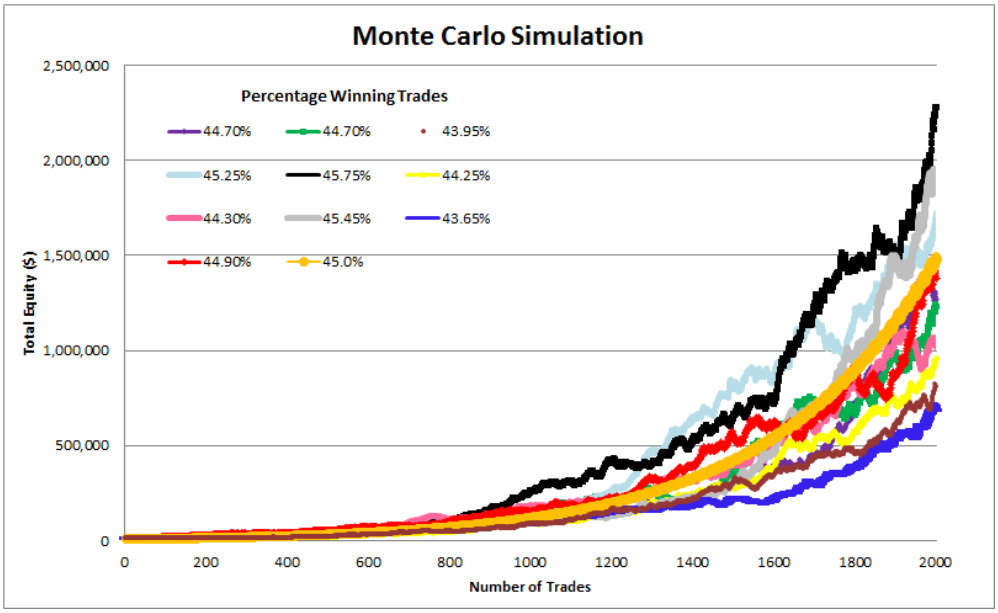
Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the "Petrel Software", "COMPASS", "Monte Carlo", "KAPPA", "Interactive Petrophysics (IP)", "ECRIN", "PIPESIM", "Eclipse Software" and "PROSPER" software's.



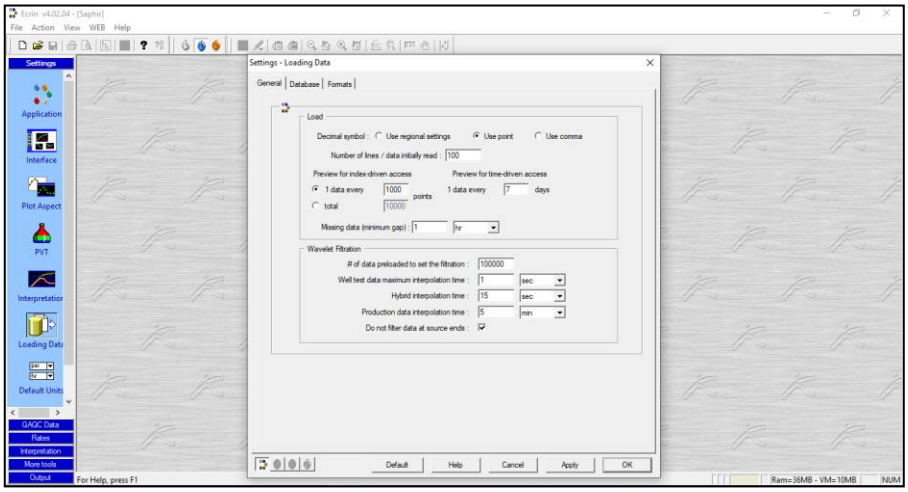
Petrel Software



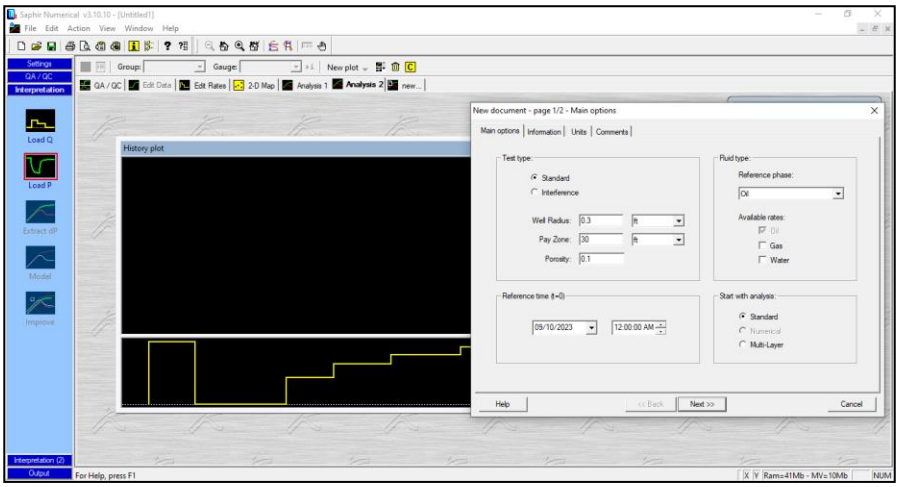
COMPASS



Monte Carlo Simulation



KAPPA Ecrin v4.02.04



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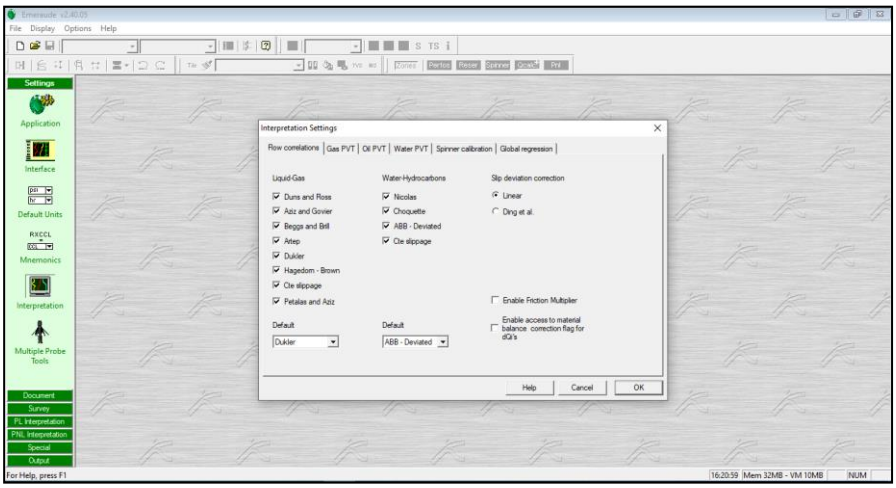

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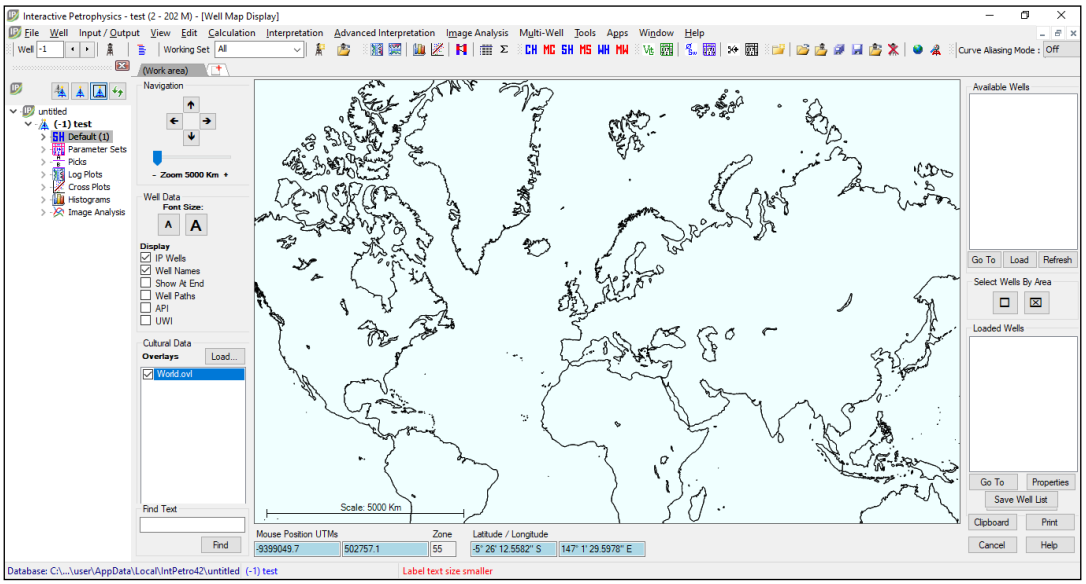
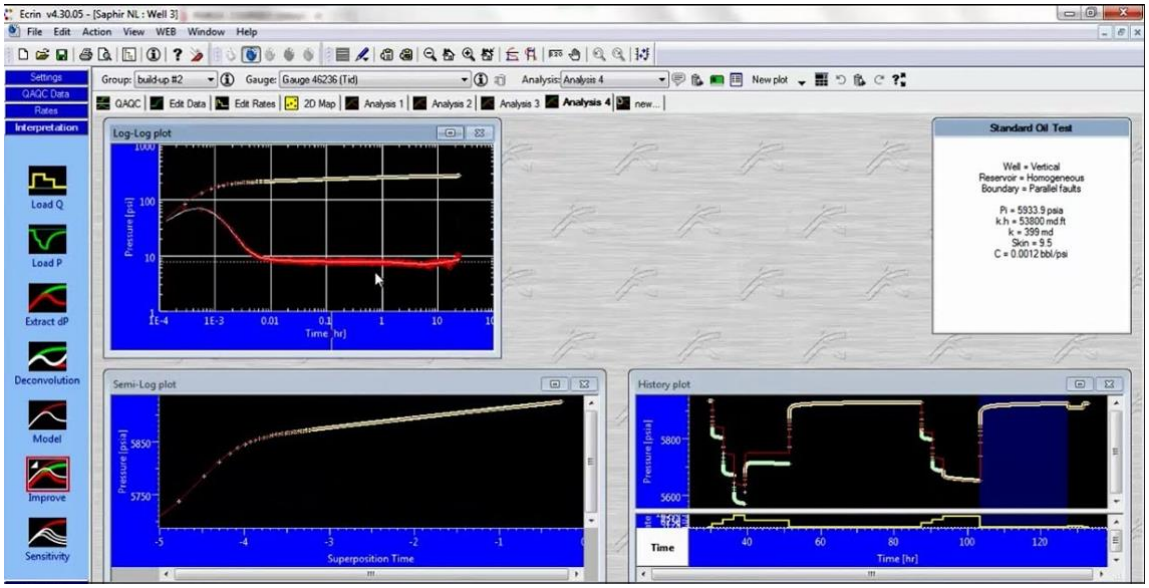
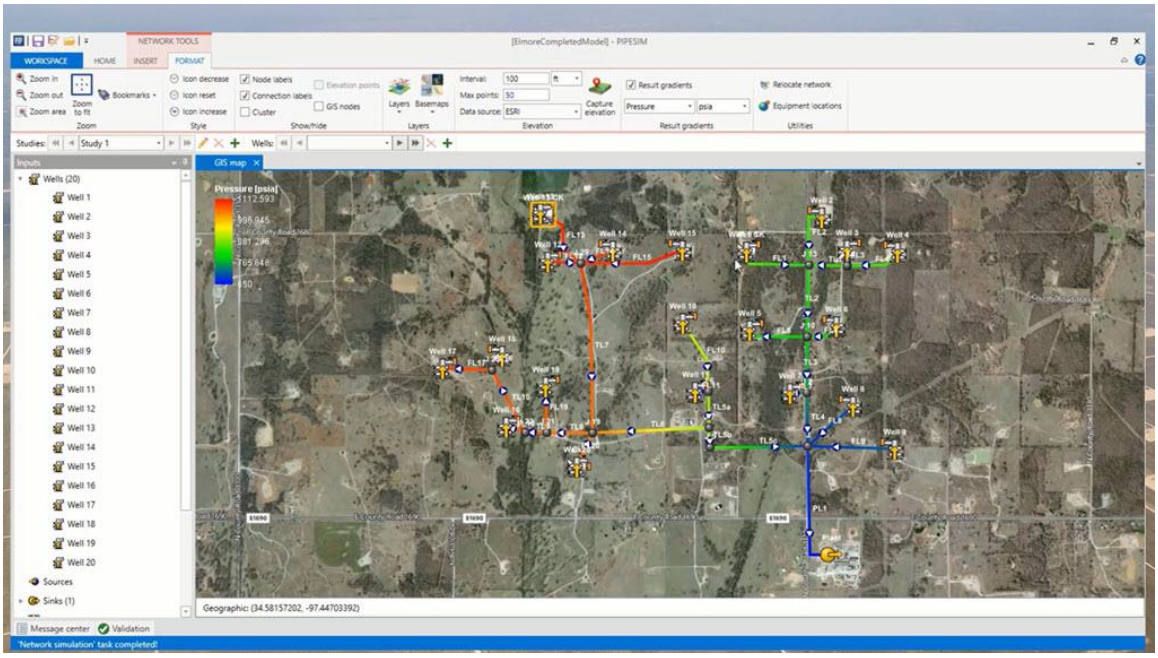


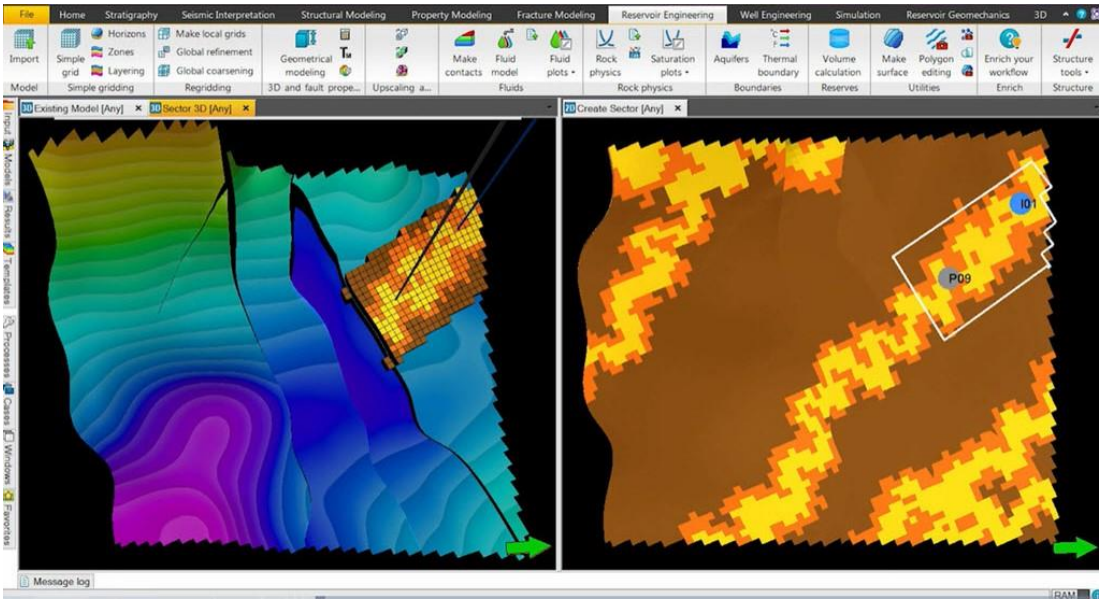
Interactive Petrophysics (IP) Software



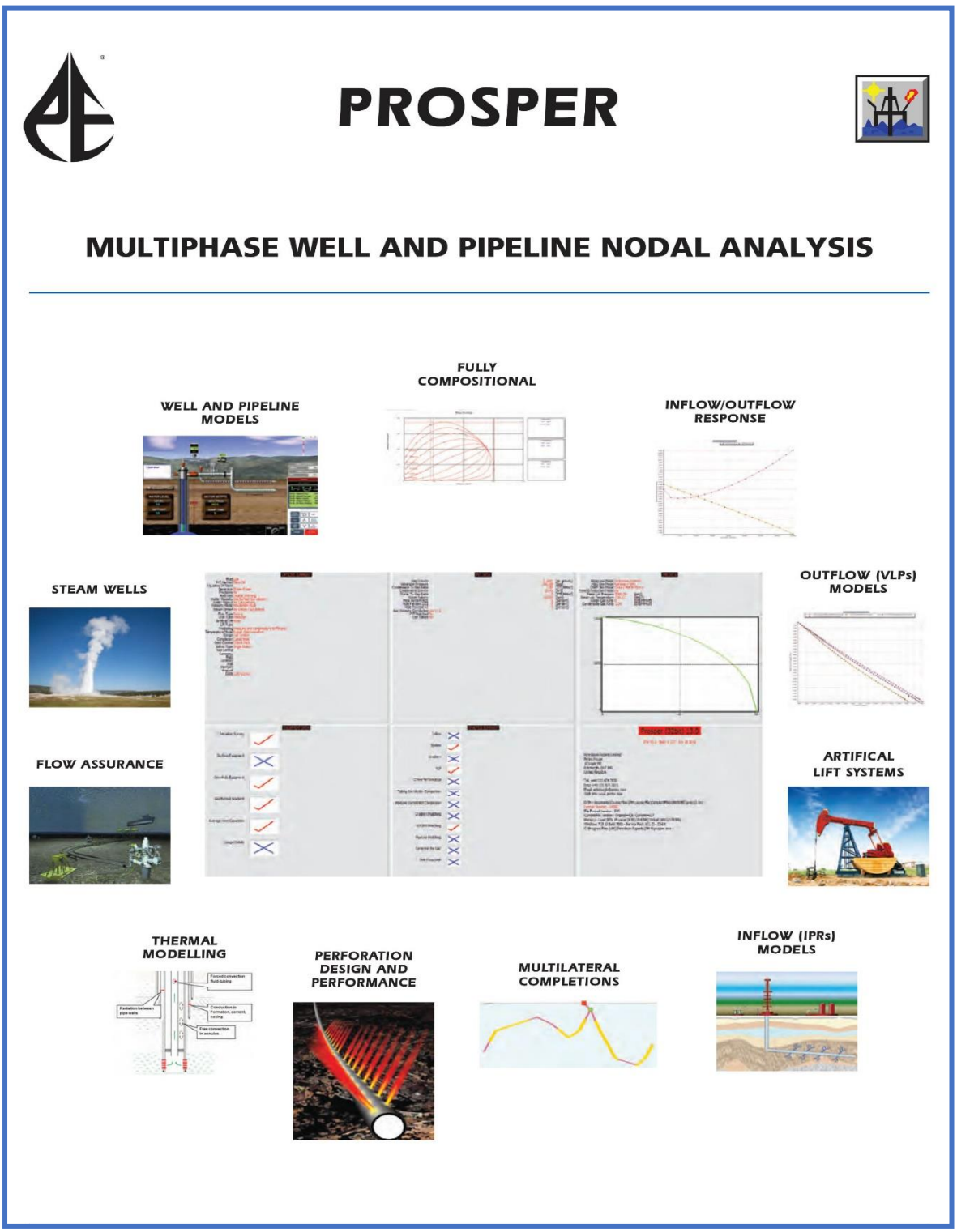
ECRIN Software



PIPESIM



Eclipse Software



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