



# **VRGS (Virtual Reality Geological Studio)**

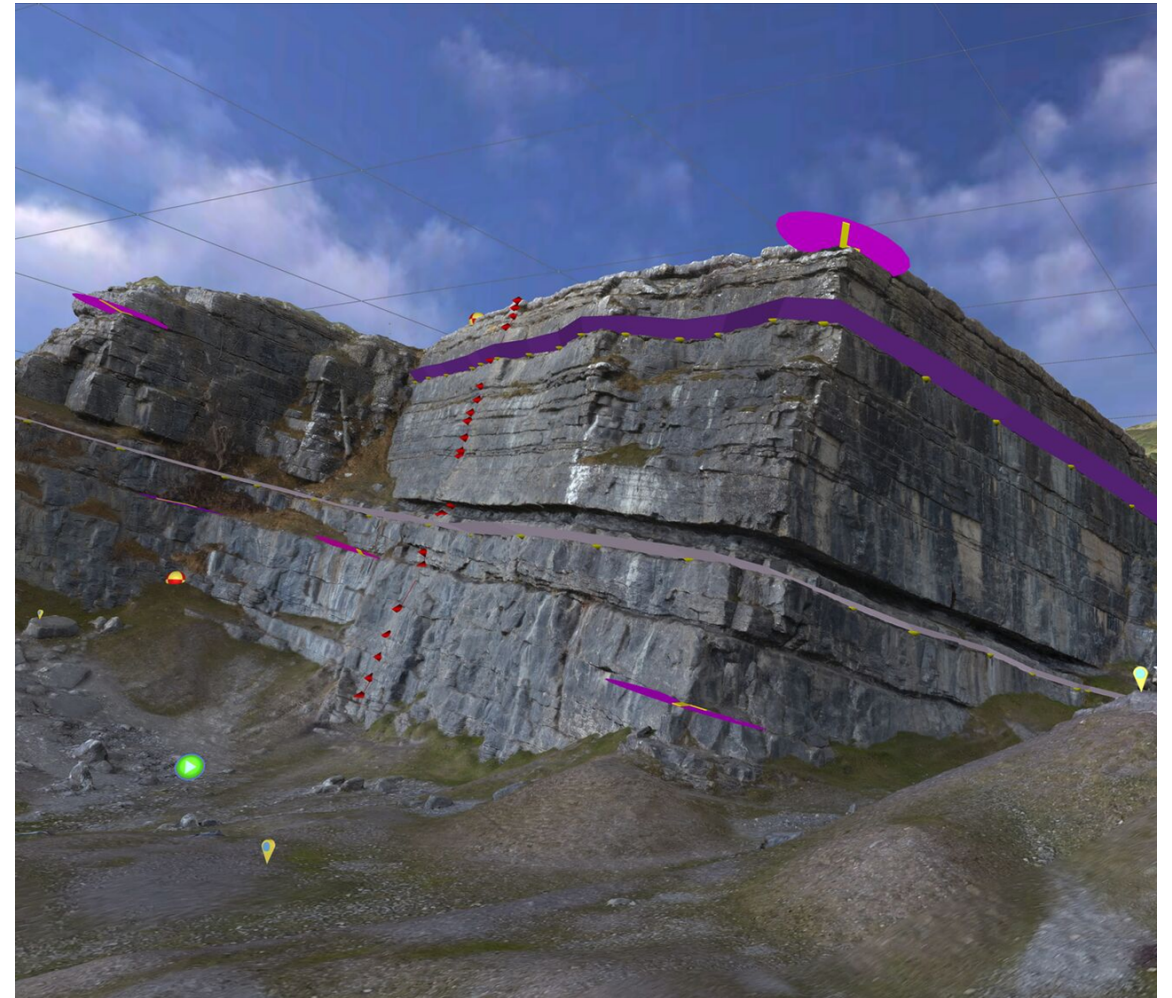
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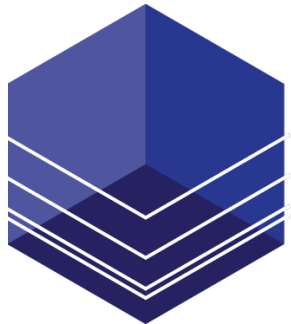
**Virtual Reality Geological Studio (VRGS)** is a 3D data visualisation and interpretation software tool for geoscientists working with 3D digital outcrop models (DOM) to support subsurface reservoir modelling in the oil & gas industry. VRGS can be easily integrated into existing workflows and output data supports increased productivity and efficiency in petroleum reservoirs.

VRGS is a professionally-developed software package that takes digital data (LiDAR, SFM, DEM or any other point cloud dataset), visualises it in 3D and provides a comprehensive toolkit for interpretation and analysis.

VRGS has been over 10 years in the making and was developed with a commercial product in mind. Thanks to its unique coding (written from scratch and employs minimal libraries) VRGS software has superior processing and data handling capabilities. Because of this it would be very difficult to replicate its capabilities.



# Why We Are Here



**VIRTUAL REALITY  
GEOLOGICAL STUDIO**  
smarter geoscience software

VRGS is a software tool that takes data from a whole array of capture techniques (drone footage, photogrammetry, Lidar etc) and then presents, manipulates and interprets them using state of the art coding in a 3D / VR format

By attending ACE2019 and pitching VRGS we hope to raise awareness of this technology.

Our first aim is to build our market presence in the oil & gas sector. VRGS is already a commercially viable product with over 300 users including oil & gas majors, training companies and academic users.

Secondly we hope to develop partnerships that will accelerate our software development programme and take our product to new territories.

Finally, through investment, we hope to further develop the software to enable diversification into new sectors (mining, environmental, hydro, geothermal, nuclear, engineering etc).

# Team Members & Brief Bios



Dr David Hodgetts: Reader in Petroleum geology and reservoir modelling at the University of Manchester and have extensive experience of working with the Oil and Gas industry on both outcrop and subsurface projects. My research involves developing software systems to solve geological problems, and am experienced in petroleum geology, reservoir modelling, numerical simulation, programming (C++ and SQL), data science and Artificial Intelligence.



Dr Ed Maughfling: Licensing manager at UMIP (technology transfer office at The University of Manchester) since 2009. Experienced in the commercialisation of University generated IP, especially software, from many disciplines and applied to multiple industry sectors.



# This is who we are

The University of Manchester, pitching VRGS, a 3D visualisation and interpretation software to support subsurface reservoir modelling in the oil & gas industry.

The University of Manchester is a centre of teaching excellence and innovative research. With 25 Nobel prize winners among our current and former staff and students, we have a history of world firsts and brilliant discoveries, from splitting the atom to giving the world graphene.

The University of Manchester is committed to world-class research, an outstanding learning and student experience, and social responsibility in everything we do.



Our vision is for VRGS to be the world leading software for the visualisation, interpretation and analysis of 3D data sets in the oil & gas industry and beyond.



# This is our mission

We sell and support a high-quality, professionally-developed software package (VRGS) with functionality informed through user feedback.

VRGS takes digital outcrop data, visualises it in 3D and provides a comprehensive toolkit for interpretation and analysis. We provide a solution for geoscientists working in variety of settings, from academic research to upstream exploration in oil & gas.

VRGS can be easily integrated into existing workflows and reduces uncertainty and increases productivity in petroleum reservoirs.

# What we want to achieve

We have already begun our commercial pathway and have licensed VRGS software to over 300 users, in 36 countries worldwide since 2015. Licensees include major oil & gas companies, training / service companies, academic geoscientists, and companies in mining and civil engineering.

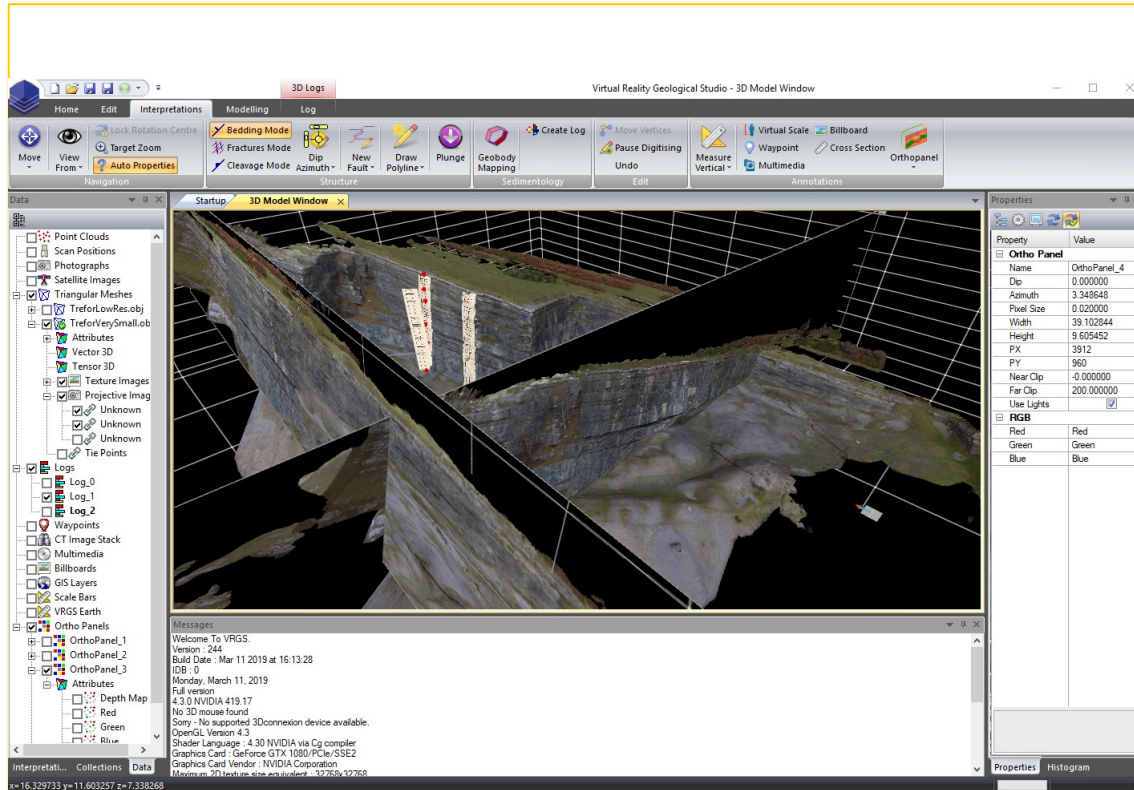
Our initial aim is to build on our existing customer base in oil & gas and to develop the software further to meet the needs of E&P in the oil and gas industry.

Where beneficial we will form partnerships to inform and accelerate our software development programme.

Long term we hope to further develop the software to enable expansion into new industry sectors secure investment to spin out from the University and to expand commercially into other sectors.



# This is our technology or process



VRGS allows you to get maximum value from your digital outcrop datasets by providing the techniques and tools to interpret, analyse and use that data effectively. The results are used by the reservoir geologists to develop conceptual models for subsurface reservoirs, reduce uncertainty in the geostatistical reservoir models (through more robust statistics and better geological understanding), and provide geological training when real world fieldtrips are not viable. The software can handle very large datasets through rendering efficiency and uses parallel processing to reduce run-times.

A comprehensive suite of interpretation tools are available which have been designed by a geoscientist for geoscientists making the software intuitive to use. These tools include both manual mapping approaches (polylines, polygons etc.) and automated techniques using a combination of traditional statistical approaches and AI techniques (smart swarm tracking, Neural Network classification).

# Here are examples of successes

- 300 licences in 36 countries worldwide
- Commercial licences with oil & gas majors
- Use for visualisation of 3D datasets in many other industries including mining, civil engineering, nuclear and aerospace
- Numerous publications in scientific and industry related journals.

## Short-term plan

We are aiming to secure as many licenses as possible with major oil & gas companies plus E&P service providers, training companies, visualisation centres etc.

Additionally we hope to form partnerships that will enable further software development and to attract customers in new territories.

We will also continue to promote the software to the academic community, to support geoscientific research but also recognising the carer pathways that lead to industry and the long term value of a loyal customer base.

We aim to secure investment to spin out from the University to support an ambitious programme of software development and marketing activity.

Future software development (e.g. inclusion of subsurface data, CT imaging) will add to the functionality of VRGS for users in oil & gas, assist with integration into upstream workflows and enable to diversification into many new sectors (mining, environmental, hydro, geothermal, nuclear, civil engineering / urban planning etc)

# How will it work? Is it working now?

We are confident of success because of our track record to date. VRGS has had a tremendous uptake since its launch and we have had overwhelmingly positive feedback from users.

We also listen to feedback from our customer base to implement additional functionality and to react quickly with any bug fixes. Underpinning this success to date is a robust software that has been written from scratch and does not use code libraries, allowing it to run smoothly (even when handling large data sets) with a fast frame rate on standard spec PCs/laptops.

We also believe that VRGS can be applied to sectors beyond oil & gas thus increasing our potential market size.



Our initial target market is oil & gas. However, there is a fundamental value of a robust and efficient-running software that can be applied to the visualisation and analysis of 3D datasets in many industries:

- Mining
- Nuclear
- Civil engineering
- Aerospace
- Hydro
- Environmental

# SWOT Analysis

## Strengths

1. The leading software in its field with unique features that fills a gap in upstream workflow
2. A robust software with fast processing and data handling capability
3. Can be used with traditional visualisation and VR
4. Potential for deployment in multiple sectors
5. Excellent product visibility within the academic market
6. Global customer base

## Weaknesses

1. Lower product visibility within the commercial sector
2. Perceived undifferentiation to other petrology software
3. Small team

## Opportunities

1. Lack of commercial products that provide the same functionality or quality
2. A market sector increasingly looking for transformative / cost-saving digital solutions
3. Reduced acquisition costs for digital data
4. Partnerships with training companies

## Threats

1. Other software in development (including those with less functionality offered free of charge)
2. Budget cuts in oil & gas sector mean greater justification for spending
3. Larger competitors could develop and release a competitive product with better market visibility
4. Future drops in oil price

# Action Steps

We are open to discussion with anyone who believes that they can assist us: whether that be who to speak to, how to develop the software or where we may be going wrong.

In the first instance we are looking to speak to new commercial customers or to anyone that can make introductions within the industry. In the medium to long term we are looking for investment to develop the product, introduce new products and enter new markets.