

ASX: ORP



Harnessing Automation and Artificial Intelligence for Discovery: Orpheus Uranium's Data-Driven Approach to Exploration

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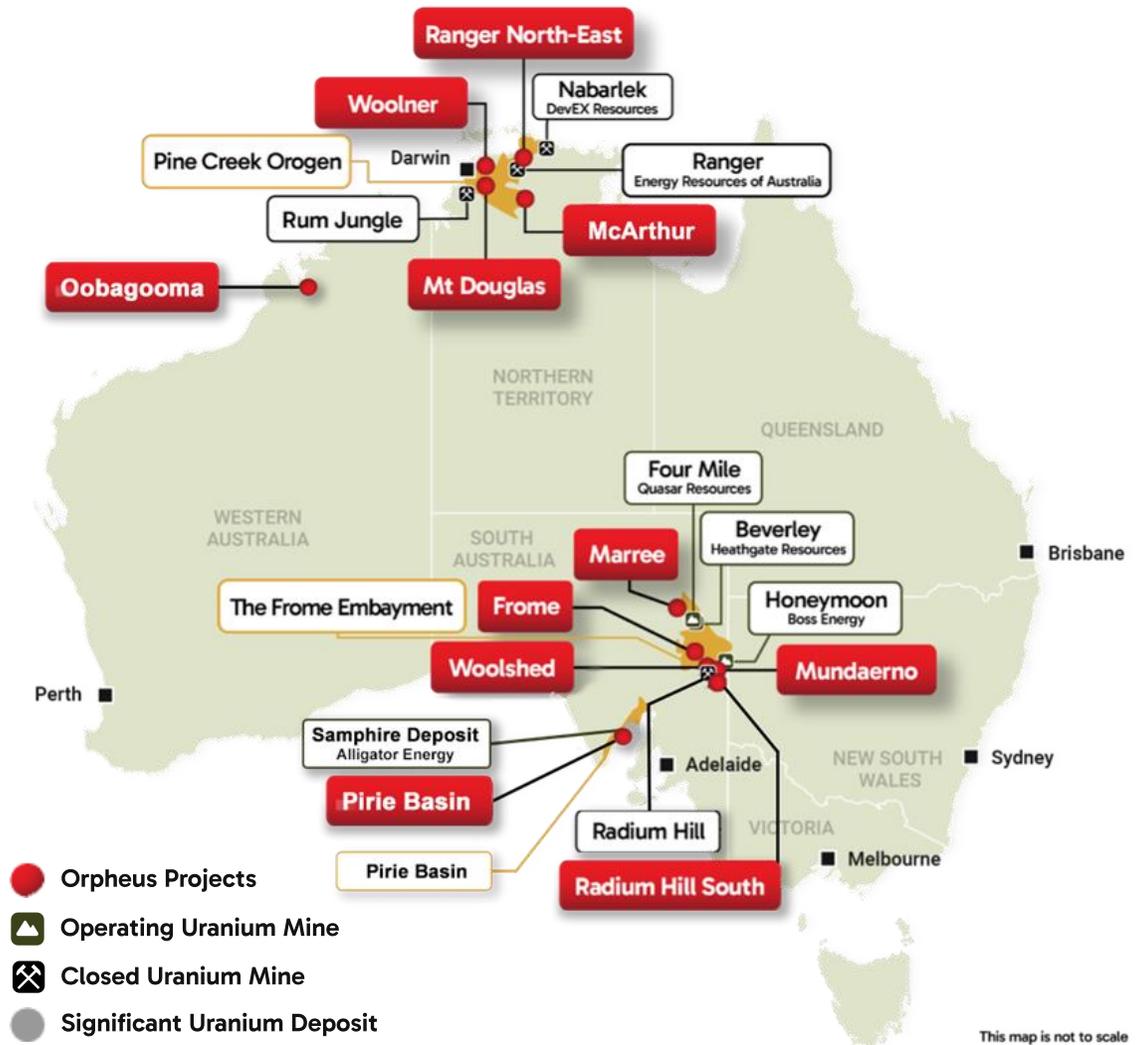
Competent Person Statement

Sections of information contained in this report that relate to Exploration Results were compiled or reviewed by Mr Clinton Dubieniecki BSc (Hons), who is a Member of the Australian Institute of Geoscientists, Member of Australian Institute of Mining and Metallurgy, and is a full-time employee of Orpheus Uranium Limited. Mr Dubieniecki has sufficient experience which is relevant to the style of mineral deposits under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 edition of the "Australasian Code for Reporting of Mineral Resources and Ore Reserves". Mr Dubieniecki consents to the inclusion in this report of the matters based on this information in the form and context in which it appears.

Who is Orpheus?

- One of **Orpheus'** key strategy is consolidating underexplored assets within proven uranium districts
- Project pipeline of uranium assets at various stages of exploration
- Core assets have abundant datasets with evidence of uranium mineralising systems
- Leveraging the company's internal technical expertise to unlock value through applying contemporary exploration techniques

AI & Automation



- ⦿ Current state of AI
- ⦿ AI examples in geosciences
- ⦿ Data Centres & Automation
- ⦿ Automation examples

AI is driving huge tech changes, affecting the way we do exploration

AI is another tool in the toolkit, not a replacement

Automation is going to drive exploration results

Current State of AI

- The AI revolution is here
- Fast-paced changes affecting every industry
- The State of the Art is a revolving door



ChatGPT example

can you explain nuclear fission to me in 50 words or less?

Nuclear fission is when a heavy atom, like uranium-235, splits into two smaller atoms after being hit by a neutron. This releases huge energy, more neutrons, and radiation. Those neutrons can cause more fissions, creating a chain reaction — the basis of nuclear power and atomic bombs.

ANTHROPIC

- Released Claude Haiku 4.5, highly competitive light-weight coding assistant

ENCORD

- Open-sourced a dataset of over 1 billion data pairs for public multimodal model training

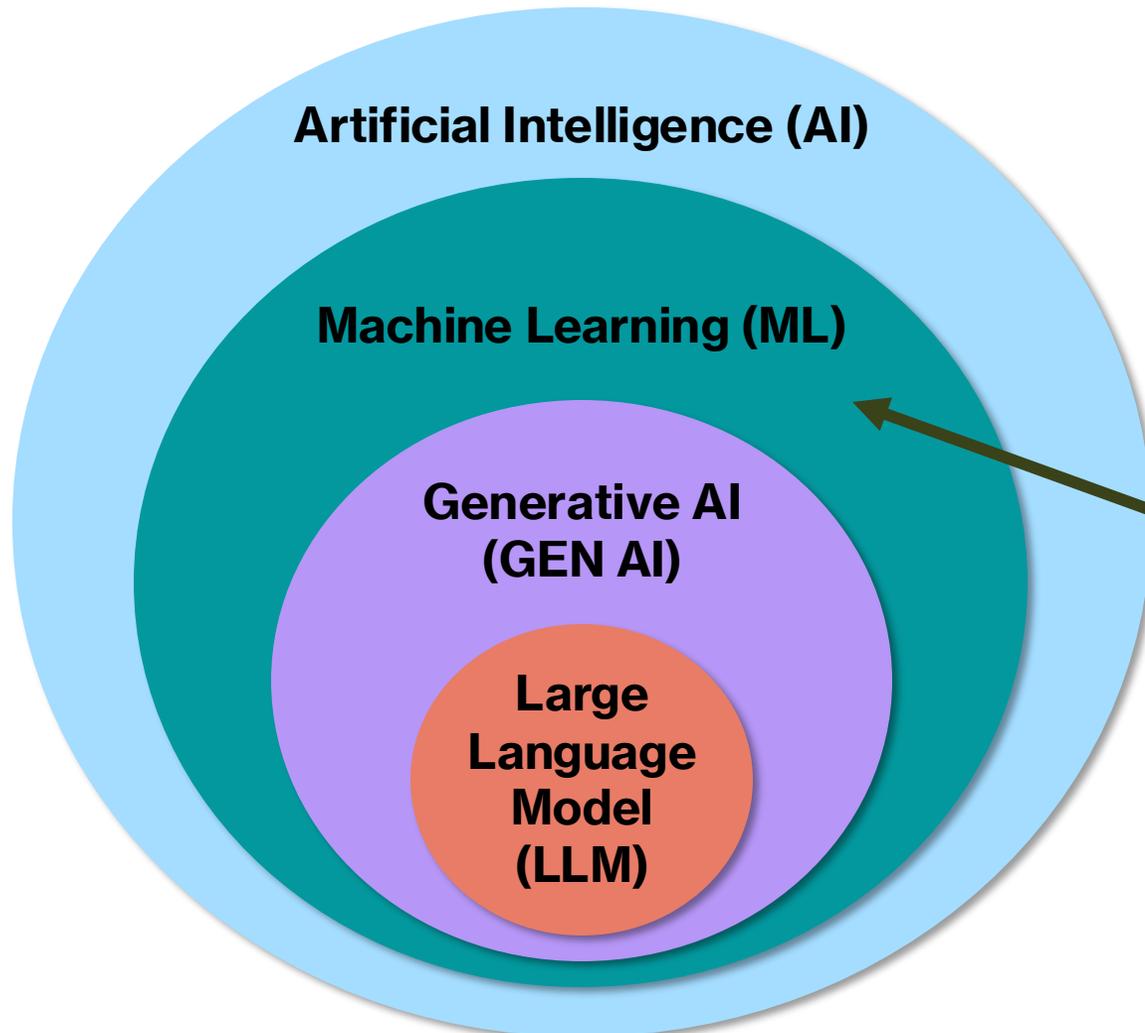
Google Cloud

- Debuted Gemini Enterprise allowing AI agents to connect securely to workspaces



- xAI released Grok “Imagine 0.9” with vast improvements on image->video generation

What is AI in the Geosciences?



AI is a **very broad** umbrella term that encompasses many sub disciplines

ChatGPT, Gemini, Grok - all previously mentioned AI is a part of **Large Language Models (LLM)** or **Large Multimodal Models (LMM)**

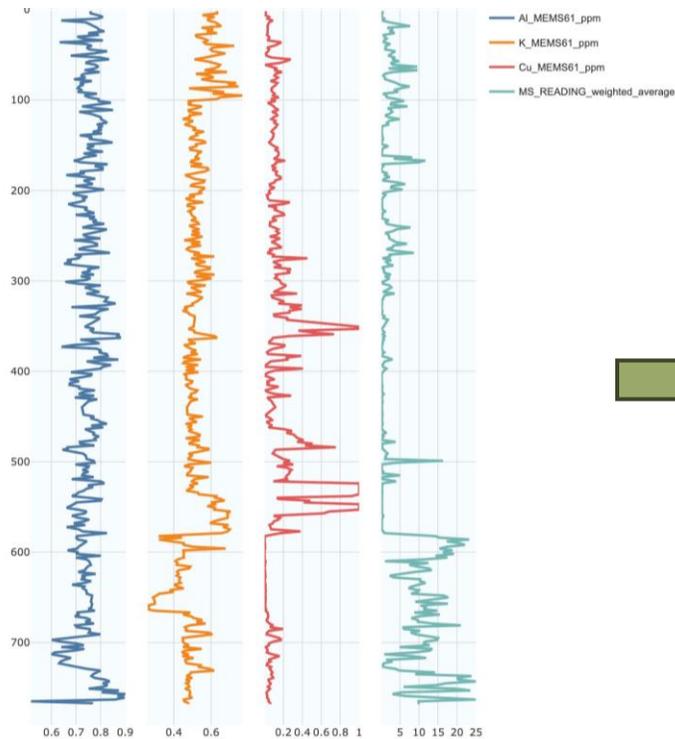
AI is not new to geosciences

- 🕒 Identify patterns in data quickly and efficiently
- 🕒 Extract more information from our datasets

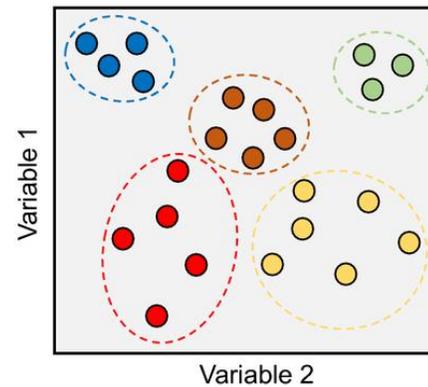
Examples of AI in the Geosciences

- Lithology domaining using downhole drilling data
 - Identifying patterns in high dimensional datasets

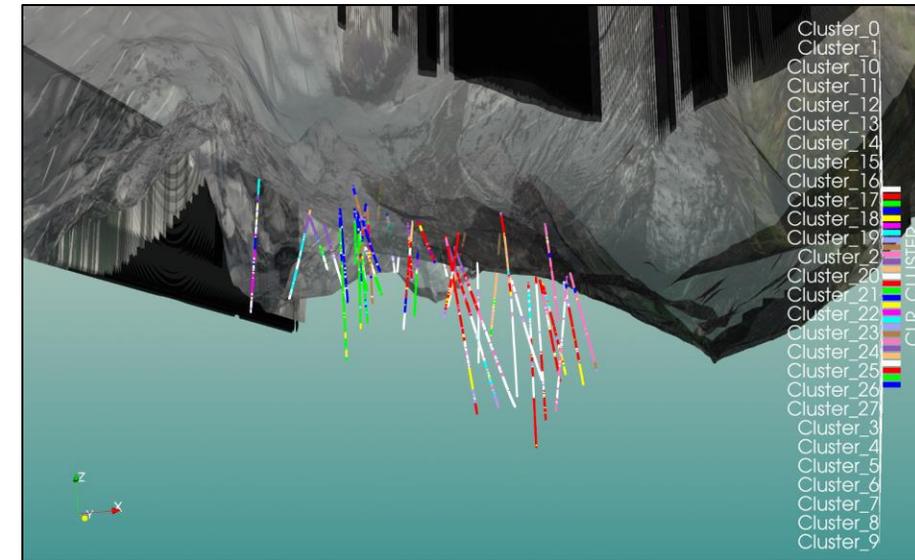
Quickly assessing multi-generational historical lithology logging



- Assay
- Petrophysics



Unsupervised Machine Learning



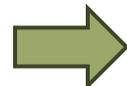
Data Driven Domaining

Examples of AI in the Geosciences

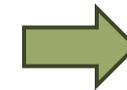
- Extracting colour information from chip imagery
 - Using computer vision to provide additional information previously unattainable



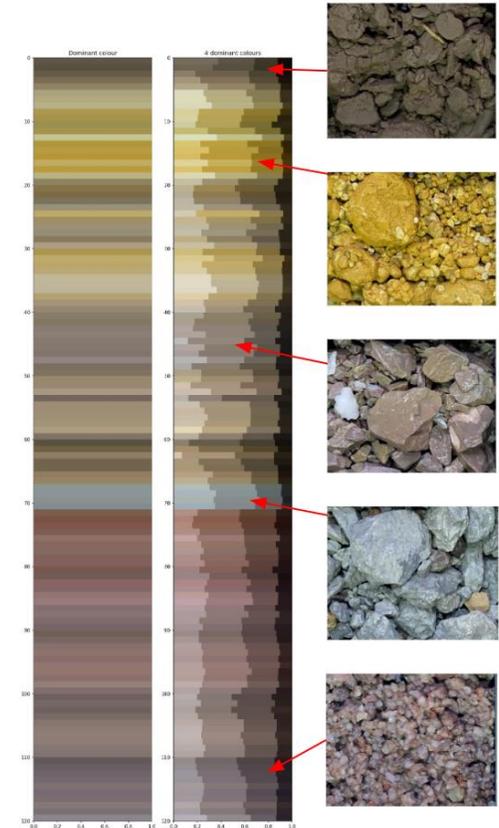
Chip Images



Extract the Dominant Colour



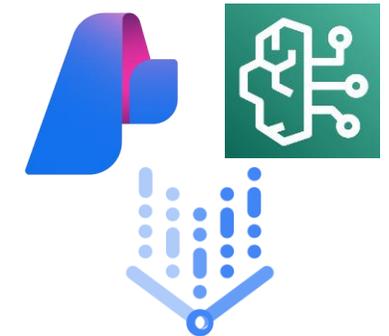
Utilising all available information



More information

Data Centres

- AI already provides great ways to improve geologists' workflows
- With the Gen-AI driven tech boom, data centres are providing services to more easily develop AI models
- Often these approaches are often treated as **static**, once off projects
- Additional cloud services offered through data centres allow us to focus on building repeatable and dynamic workflows, through the means of **automation**



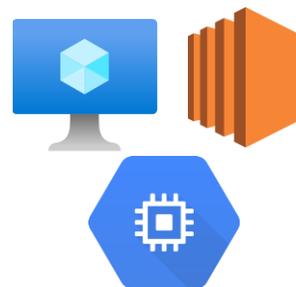
AI Development
Tools



Relational
Databases



File Storage



Virtual Machines



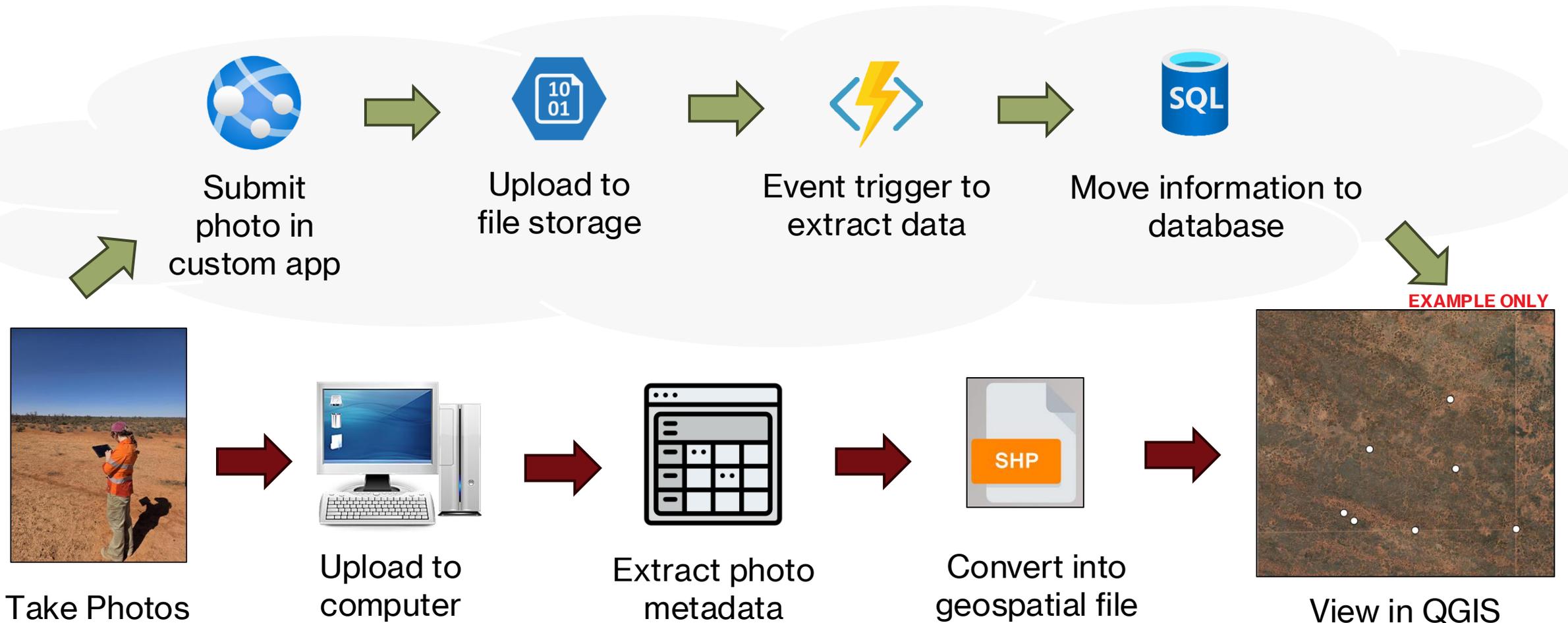
Application
Hosting



Data
Orchestration

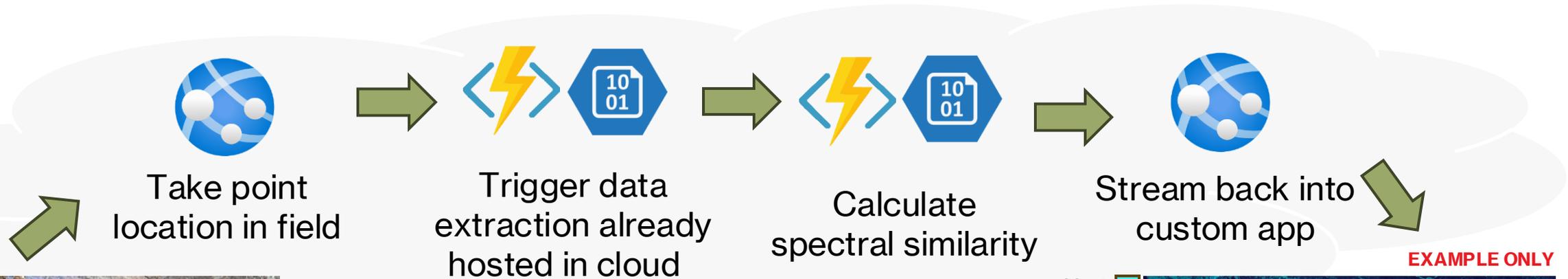
Automation Example 1

We are in the field and we are taking photos that we want to plot the location they were taken on a map

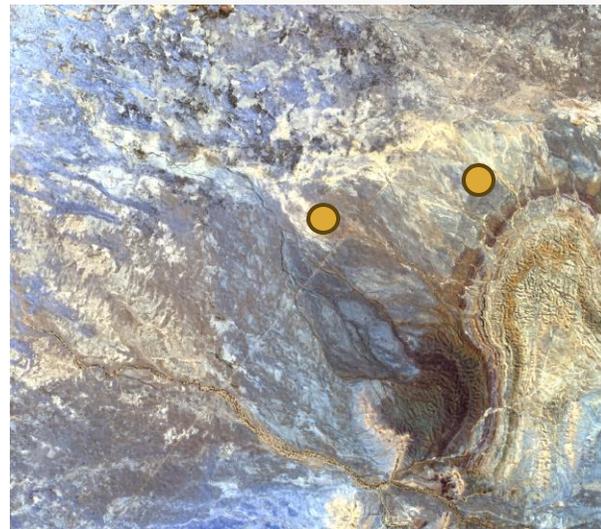


Automation Example 2

We have a surface geology point and we want to find similar spectral surface expressions



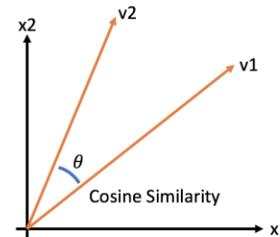
EXAMPLE ONLY



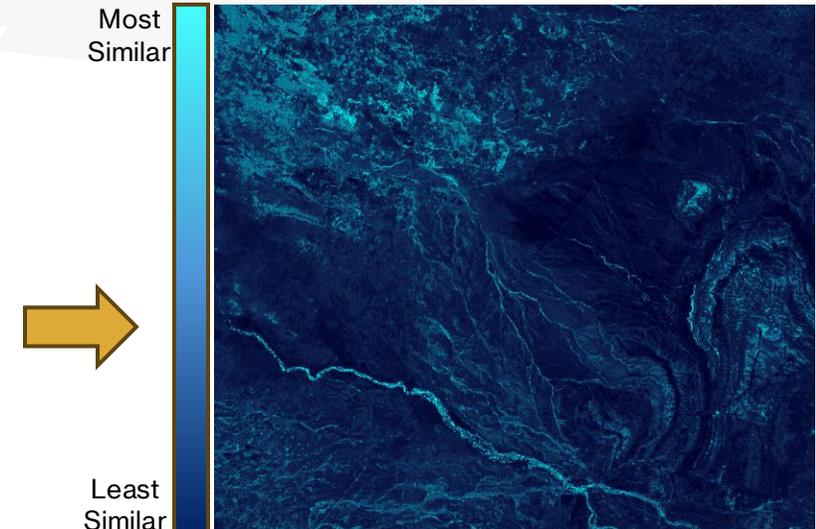
Multispectral Satellite Data



Data Preprocessing



Calculate spectral similarity



Visualise and Interpret

Automation Example 3

We have some historic assay data we want to convert into tabular data for further analysis

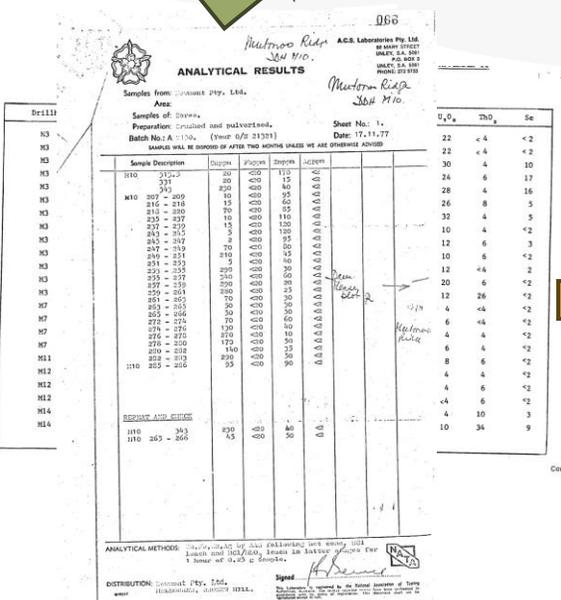

Upload to
cloud (blob)


AI identify
tables


AI extract
geochemistry


AI match
schema
requirements


Drilling
Database



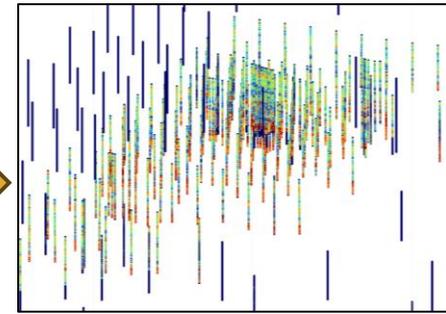
LMM

Use Gen AI to
extract to a table
format

Drillhole	From (m)	To (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mo (ppm)	V (ppm)	U ₃ O ₈ (ppm)	ThO ₂ (ppm)	Se (ppm)
M3	102.0	103.5	5	5	10	2	<20	22	<4	<2
M3	103.5	105.0	5	<5	8	1	<20	22	<4	<2
M3	105.0	106.5	12	5	30	2	30	30	4	10
M3	109.5	111.0	12	5	30	2	40	26	8	5
M3	111.0	112.5	25	10	22	1	40	32	4	5
M3	112.5	114.0	5	5	12	2	20	10	4	<2
M3	114.0	115.5	0.8	5	15	1	20	12	6	3
M3	115.5	117.0	5	5	10	2	20	10	6	<2
M3	117.0	118.5	8	5	18	1	20	12	<4	2
M3	118.5	120.0	12	8	20	1	45	20	6	<2
M3	133.5	136.5	15	18	40	1	150	12	26	<2
M7	108.0	111.0	5	<5	12	1	<20	4	<4	<2
M7	111.0	114.0	8	<5	10	1	<20	6	<4	<2
M7	114.0	117.0	8	<5	8	1	<20	4	4	<2
M7	117.0	120.0	8	<5	8	1	<20	6	4	<2
M11	115.5	117.0	15	10	20	2	20	8	6	<2
M12	109.5	112.5	2	<5	10	1	60	4	4	<2
M12	112.5	115.5	5	<5	10	1	65	4	6	<2
M12	115.5	118.5	8	5	18	1	30	<4	6	<2
M14	106.5	109.5	5	10	65	1	400	4	10	3
M14	126.0	127.5	550	38	20	3	20	10	34	9



Manipulate to
suit data
standards



Visualise and
Interpret

EXAMPLE ONLY

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Key Takeaways

1. AI is driving huge tech changes, affecting the way we do exploration
2. AI is another tool in the toolkit, not a replacement
3. Automation is going to drive exploration results

Why does this matter?

We have a great team of geologists with a wealth of knowledge regarding uranium systems.

Utilising AI and automation provides us with an approach that can expedite uranium exploration, extract valuable information quickly from our large pipeline of projects and get knowledge into the hands of these decision-making experts



ChatGPT

GPT = Generative Pre-trained Transformer

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