A dramatic landscape photograph of a baobab tree in Zimbabwe at sunset. The tree stands centrally, its thick, textured trunk and spiky branches silhouetted against a vibrant orange and yellow sky. Large, dark, craggy rocks frame the scene on the left and right, with the sun's rays breaking through a gap on the left. The foreground is filled with more rocks, some catching the low light.

Practical Uses of AI for Zimbabwe

Steven Duma (Pr. Sc. Nat,
FGGSA)

Machine learning pioneers win Nobel prize in physics

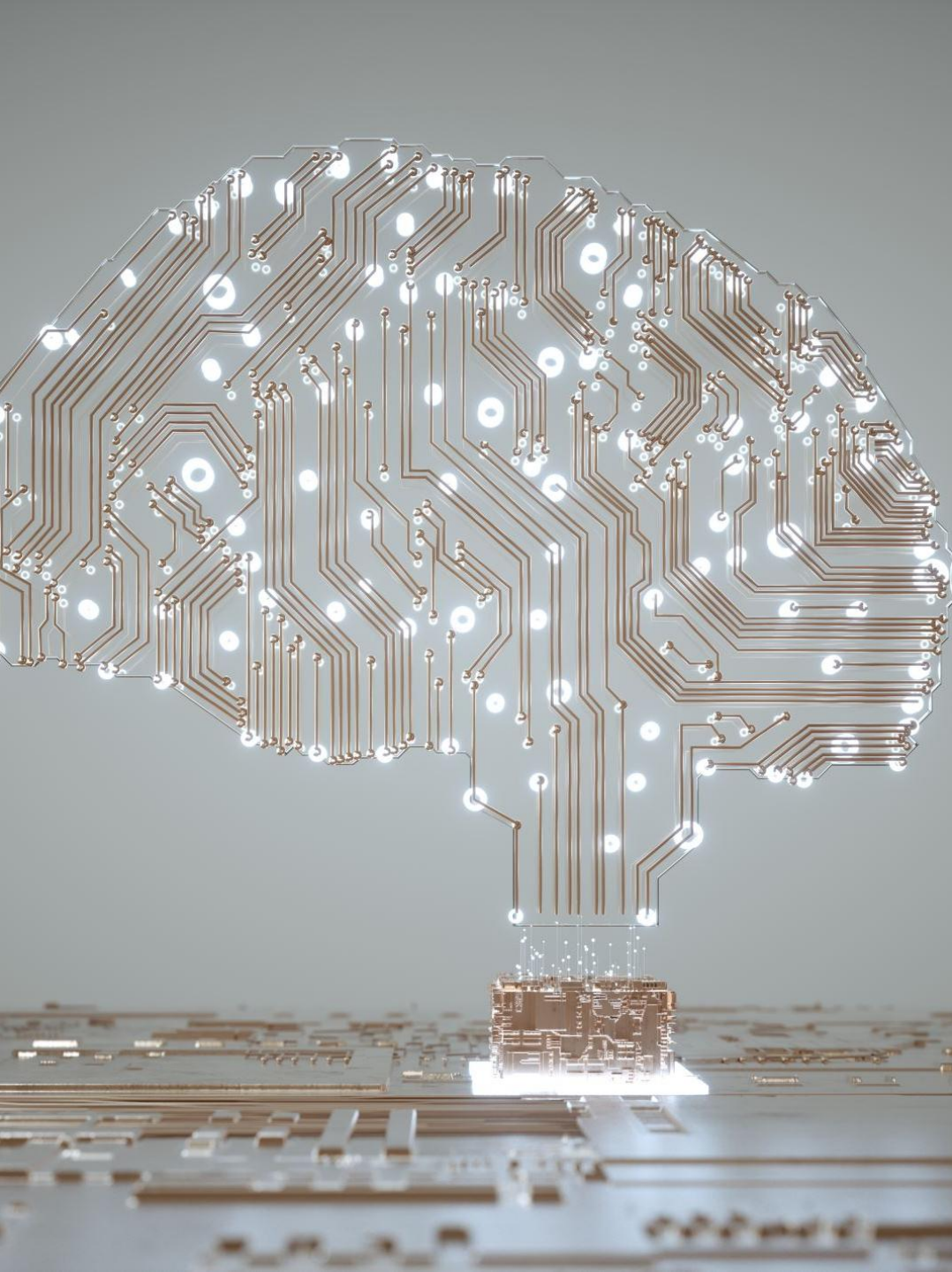
Geoffrey Hinton and **John Hopfield** awarded for "foundational discoveries and inventions that enable machine learning with artificial neural networks".

Geoffrey Hinton, 'godfather of AI', and John Hopfield honoured for work on artificial neural networks



John Hopfield, left, and Geoffrey Hinton will share the 11m Swedish kronor (about £810,000) prize. Photograph: AP

Demonstrated how computer programs that draw on neural networks and **statistics** could form the basis for an entire field, which paved the way for **swift** and **accurate** language translation, facial recognition systems, and are what we call generative AI.



Definitions of

AI Artificial Intelligence (AI) can be defined as the ability to simulate human intelligence in machines. AI can perform tasks such as technical reasoning, problem-solving, and learning which give decision-making power.

Definition of mies Geologists.

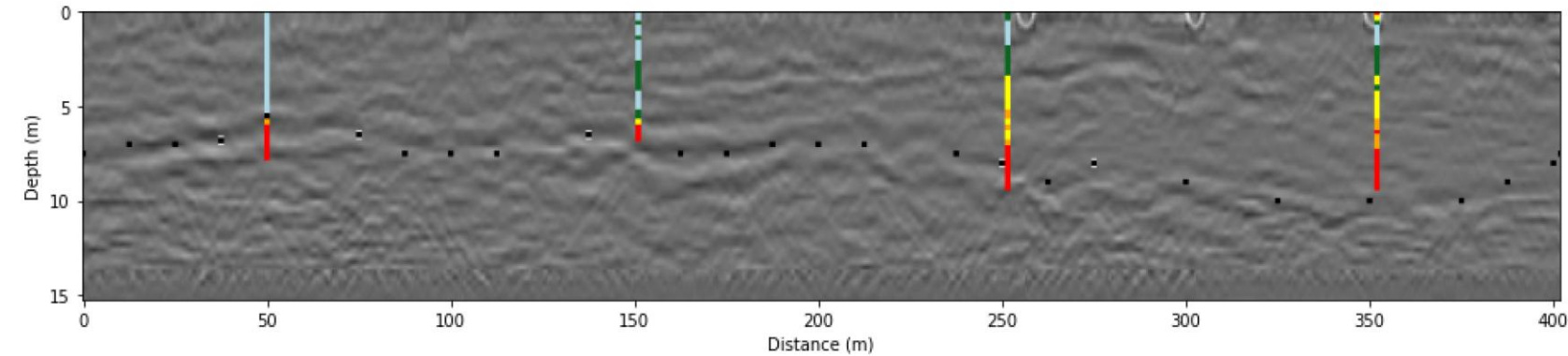
A set of technologies that enable computers to perform a variety of advanced functions, including the ability to:

1. see,
2. understand
3. translate language,
4. analyze data and images,
5. make recommendations,
6. and more eg take action...

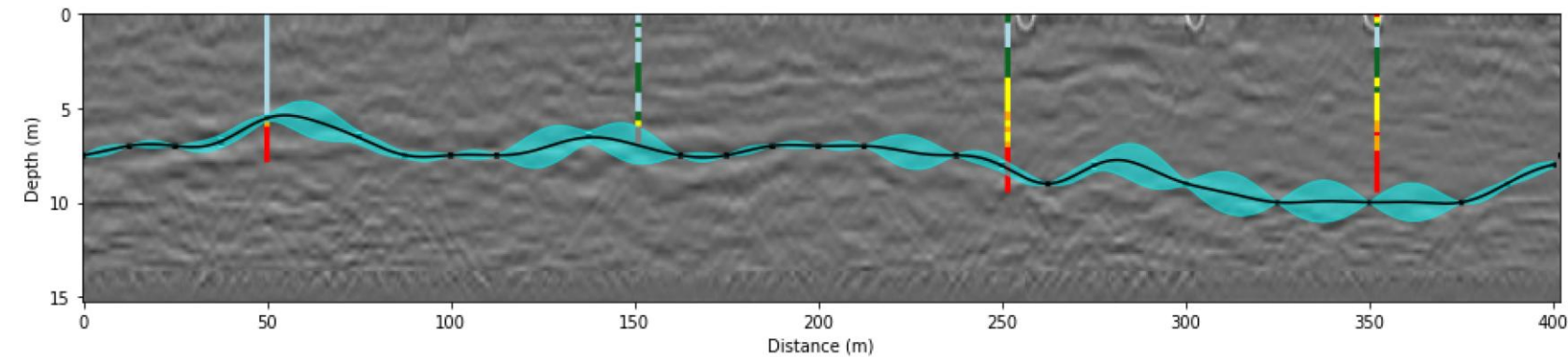


Forget the Hype!

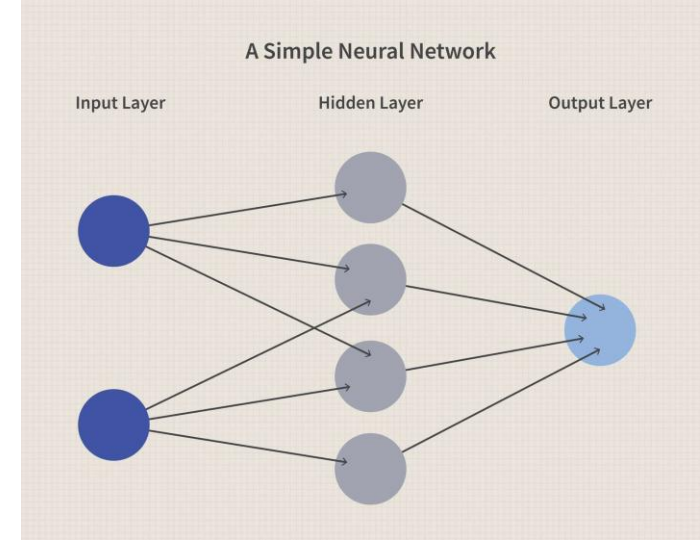
What about Zimbabwe?



(a)



(b)



Neural Networks simply join the dots and this is what geologists do as per instruction or probability.

Start joining the dots - these
are gold mines



There must be a strategy in your Arsenal to create data that can be used by AI.

AI Ready data

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
MONTH	STOPE NAME	Level	Section	Stope ID	YTD Budget Tonnes(t)	YTD Budget Grade (g/t)	YTD Budget Gold (Kg)	YTD Actual Stopping(t)	YTD Stopping Grade (g/t)	YTD Stopping Gold (Kg)	YTD Reconciled Tonnage (t)	YTD Reconciled Grade (g/t)	YTD Reconciled Gold (kg)	Var (Tons)	Var (Grav)	Var (Gold Content)
Jan-25	4L W23A	4	W23A	4L W23A STOPE	6,510	2.44	15.88	6,179	3.26	15.9	5,363.58	2.73	14.65	(815)	▲	12%
Jan-25	4L W26	4	W26	4L W26 STOPE	1,085	2.12	2.30	1,458	1.21	2.3	1,265.59	1.02	1.29	(192)	▲	-52%
Jan-25	5L W4 S	5	W4 S	5L W4 STOPE	1,085	1.86	2.02	754	0.47	2.0	654.50	0.39	0.26	(100)	▲	-79%
Jan-25	5L W7 S	5	W7 S	5L W7 STOPE	4,060	2.01	8.16	4,555	1.88	8.2	3,953.89	1.57	6.22	(601)	▲	-22%
Jan-25	5L W8 S	5	W8 S	5L W8 STOPE	3,255	1.80	5.86	2,610	2.43	5.9	2,265.13	2.03	4.81	(344)	▲	13%
Jan-25	6L E1 S	6	E1 S	6L E1 STOPE	2,100	3.16	6.64	2,028	3.18	6.6	1,760.55	2.67	4.70	(268)	▲	-16%
Jan-25	6L E5 S	6	E5 S	6L E5 STOPE	1,050	1.05	1.10	-	-	-	-	-	-	-	▼	-100%
Jan-25	6L W6 S	6	W6 S	6L W6 STOPE	1,050	2.73	2.86	1,949	2.79	2.9	1,691.80	2.33	3.95	(257)	▼	-14%
Jan-25	6L W8 S	6	W8 S	6L W8 STOPE	2,100	2.19	4.61	804	2.60	4.6	697.90	2.18	1.52	(106)	▼	-1%
Jan-25	6L W9 S	6	W9 S	6L W9 STOPE	2,100	2.66	5.59	3,535	2.22	5.6	3,068.06	1.86	5.70	(466)	▼	-30%
Feb-25	3L W23A	3	W23A	3L W23A STOPE	1,960	2.85	5.59	1,564	1.94	5.6	1,385.56	1.60	2.21	(178)	▼	-44%
Feb-25	3L W24A	3	W24A	3L W24A STOPE	980	1.81	1.77	-	-	1.8	-	-	-	-	▼	-100%
Feb-25	4L W23A	4	W23A	4L W23A STOPE	2,940	3.54	10.41	5,794	2.96	10.4	5,132.94	2.44	12.50	(661)	▼	-31%
Feb-25	4L W26	4	W26	4L W26 STOPE	1,960	1.31	2.57	1,105	1.03	2.6	978.93	0.85	0.83	(126)	▼	-35%
Feb-25	5L W7 S	5	W7 S	5L W7 STOPE	1,960	1.69	3.31	2,689	2.16	3.3	2,382.20	1.78	4.25	(307)	▲	5%
Feb-25	5L W8 S	5	W8 S	5L W8 STOPE	3,920	2.97	11.25	1,603	2.25	11.3	1,420.11	1.85	2.63	(183)	▼	-36%
Feb-25	6L E1 S	6	E1 S	6L E1 STOPE	2,940	3.23	9.50	4,343	3.69	9.5	3,947.49	3.04	11.70	(496)	▼	-6%
Feb-25	6L W10	6	W10	6L W10 STOPE	980	2.75	2.70	660	1.25	2.7	584.70	1.03	0.60	(75)	▼	-63%
Feb-25	6L W14	6	W14	6L W14 STOPE	1,960	2.75	5.39	68	0.79	5.4	60.24	0.65	0.04	(8)	▼	-76%
Feb-25	6L W2 S	6	W2 S	6L W2 STOPE	980	2.91	2.85	2,329	4.18	2.9	2,063.28	3.44	7.10	(266)	▲	18%
Feb-25	6L W8 S	6	W8 S	6L W8 STOPE	1,960	2.60	5.10	353	2.54	5.1	312.72	2.09	0.65	(40)	▼	-19%
Feb-25	6L W9 S	6	W9 S	6L W9 STOPE	2,940	2.53	7.44	4,489	3.04	7.4	3,976.83	2.51	9.97	(512)	▼	-1%
Mar-25	1L W24	1	W24	1L W24 STOPE	1,085	2.30	2.79	1.12	2.5	2.5	235.23	0.96	0.23	(44)	▼	-58%
Mar-25	3L W23A	3	W23A	3L W23A STOPE	1,260	3.85	4.85	1,294	3.32	4.9	1,091.00	2.84	3.10	(203)	▲	-26%
Mar-25	4L W23A	4	W23A	4L W23A STOPE	2,660	3.45	9.17	2,821	2.59	9.2	2,378.46	2.21	5.27	(443)	▼	-36%
Mar-25	4L W23B	4	W23B	4L W23B STOPE	4,340	3.85	16.71	4,684	3.73	16.7	3,949.20	3.19	12.60	(735)	▼	-17%
Mar-25	4L W26	4	W26	4L W26 STOPE	1,085	2.12	2.30	1,394	3.38	2.3	1,175.32	2.89	3.40	(219)	▲	36%
Mar-25	5L W7 S	5	W7 S	5L W7 STOPE	2,170	2.13	4.62	2,581	2.40	4.6	2,176.11	2.05	4.47	(405)	▼	-3%
Mar-25	5L W8 S	5	W8 S	5L W8 STOPE	1,120	2.02	2.26	448	1.72	2.3	377.72	1.47	0.56	(70)	▼	-27%
Mar-25	6L E1 S	6	E1 S	6L E1 STOPE	2,170	3.89	8.44	2,242	3.69	8.4	1,890.29	3.15	5.96	(352)	▼	-19%
Mar-25	6L W1 S	6	W1 S	6L W1 STOPE	3,255	3.89	12.66	3,335	3.59	12.7	2,811.82	3.07	8.62	(523)	▼	-21%
Mar-25	6L W10	6	W10	6L W10 STOPE	1,085	2.17	2.35	107	2.31	2.4	90.21	1.98	0.18	(17)	▼	-9%
Mar-25	6L W2 S	6	W2 S	6L W2 STOPE	2,170	2.91	6.31	2,077	3.12	6.3	1,751.17	2.67	4.67	(326)	▼	-8%
Mar-25	6L W8 S	6	W8 S	6L W8 STOPE	2,170	2.84	6.16	1,510	2.37	6.2	1,273.12	2.02	2.58	(237)	▼	-29%
Mar-25	6L W9 S	6	W9 S	6L W9 STOPE	4,340	2.53	10.98	4,277	3.17	11.0	3,606.05	2.71	9.78	(671)	▲	7%
Apr-25	1L W24	1	W24	1L W24 STOPE	2,030	2.22	4.51	1,793	2.47	4.5	1,462.73	1.86	2.72	(330)	▼	-16%
Apr-25	3L W23A	3	W23A	3L W23A STOPE	3,045	3.72	11.32	3,354	3.05	11.3	2,736.19	2.29	6.27	(618)	▼	-38%
Apr-25	4L W23B	4	W23B	4L W23B STOPE	4,060	3.85	15.63	4,229	3.39	15.6	3,450.01	2.55	8.80	(779)	▼	-34%
Apr-25	4L W26	4	W26	4L W26 STOPE	2,030	2.10	4.26	2,080	3.86	4.3	1,896.86	2.90	4.92	(363)	▲	38%
Apr-25	5L W7 S	5	W7 S	5L W7 STOPE	1,050	2.13	2.23	1,916	2.57	2.2	1,073.59	1.93	2.07	(242)	▼	-9%
Apr-25	5L W8 S	5	W8 S	5L W8 STOPE	1,540	2.02	3.11	1,860	3.09	3.1	1,517.39	2.32	3.52	(243)	▲	15%
Apr-25	6L E1 S	6	E1 S	6L E1 STOPE	2,030	3.89	7.90	1,987	4.43	7.9	1,620.99	3.33	5.39	(366)	▼	-15%
Apr-25	6L W1 S	6	W1 S	6L W1 STOPE	1,960	3.89	7.62	1,977	3.80	7.6	1,612.83	2.86	4.61	(364)	▼	-27%

Do a one-pager guiding document that will be your base case.



Legend

- Fence
- ▣ Artisanal shaft
- peerless_orebody
- ore_stringers
- bulged_zones

Pickstone Claims

Pickstone Minesite

Warren 2

Searchable data

I asked Gemini to find deposits and specified Zimbabwe



Map of Major African Exploration Projects (Including Ariana Resources)

The map below includes the locations for all the specific mining projects detailed in the table.

Company	Mineral	Country	Project / Mine Location	Date of Announcement	Type of Drilling/Technology
Ariana Resources (AAU)	Gold (Au)	Zimbabwe	Dokwe Gold Project	Oct 15, 2025	RC Rig Mobilization (c. 11,000m total program)
Ariana Resources (AAU)	Gold (Au)	Zimbabwe	Dokwe Gold Project	Jun 26, 2025	Updated Economic Model & PFS
Kavango Resources PLC	Gold (Au)	Zimbabwe	Nightshift Gold Project, Hillside Project	Oct 20, 2025	Resource Definition Drilling

AI-Driven Geological and Ore Analysis

- The truth is the technology is Generative so it creates content.
- It is fast
- It is sometimes accurate (just like geologists)
- Image by Gemini



Use the technology

FutureSmart
Mining™

- **Diamond Drilling Costs:** Industry reports project a decrease in African diamond drilling costs (up to 15% in 2025) due to adoption of **automated rigs** and advanced targeting of sites

Anglo embraced AI and all sites are showing savings.

Debswana used AI to optimize hauling routes and blast fragmentation – saved 17% on tyres.

Zimbabwe use cases



Intelligent Ore
Sorting

AI-Powered Training

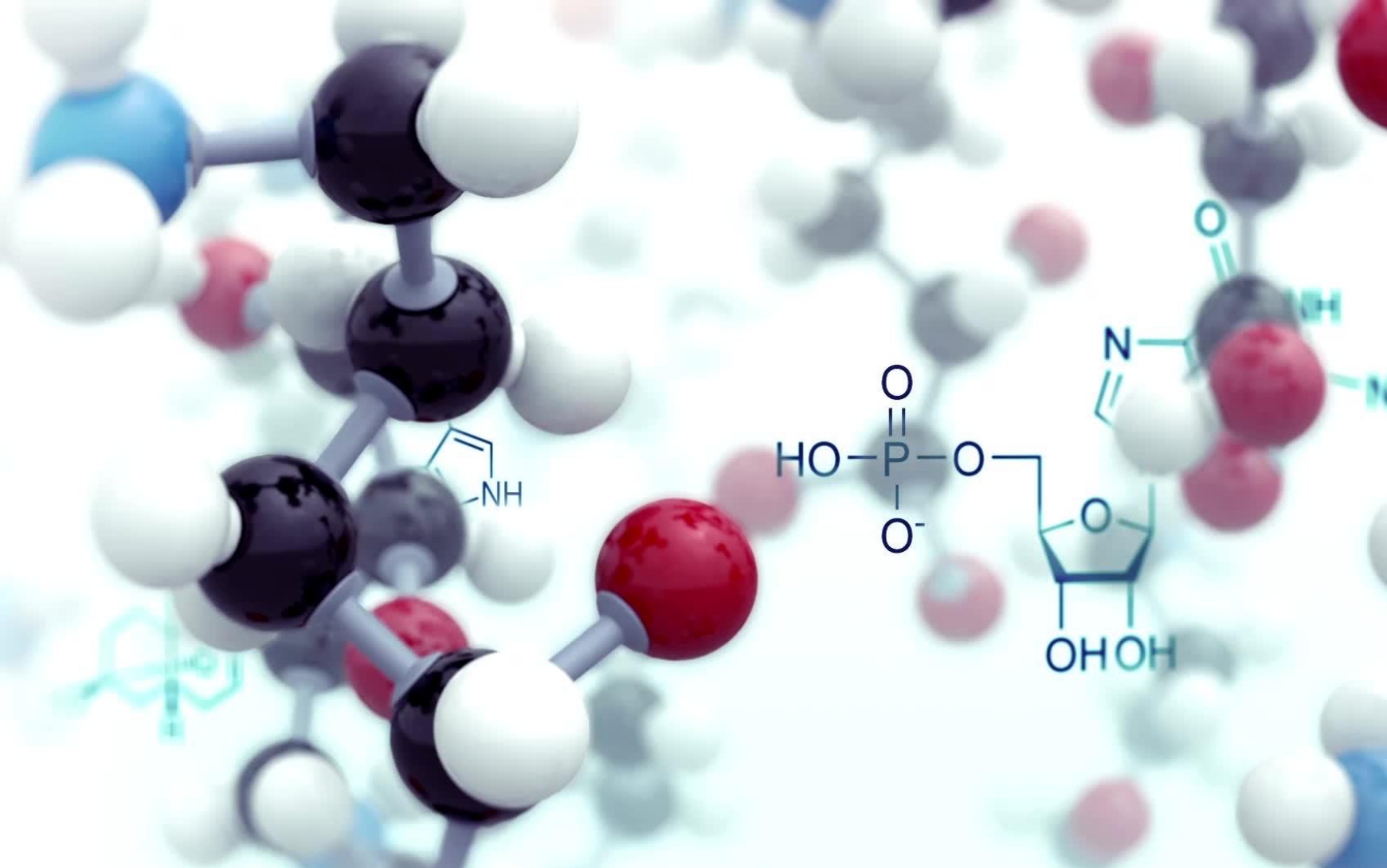


Optimizing
Logistics

Environmental
Monitoring:



Resource and Grade
Prediction



Thank
you