VIDEO REPORT

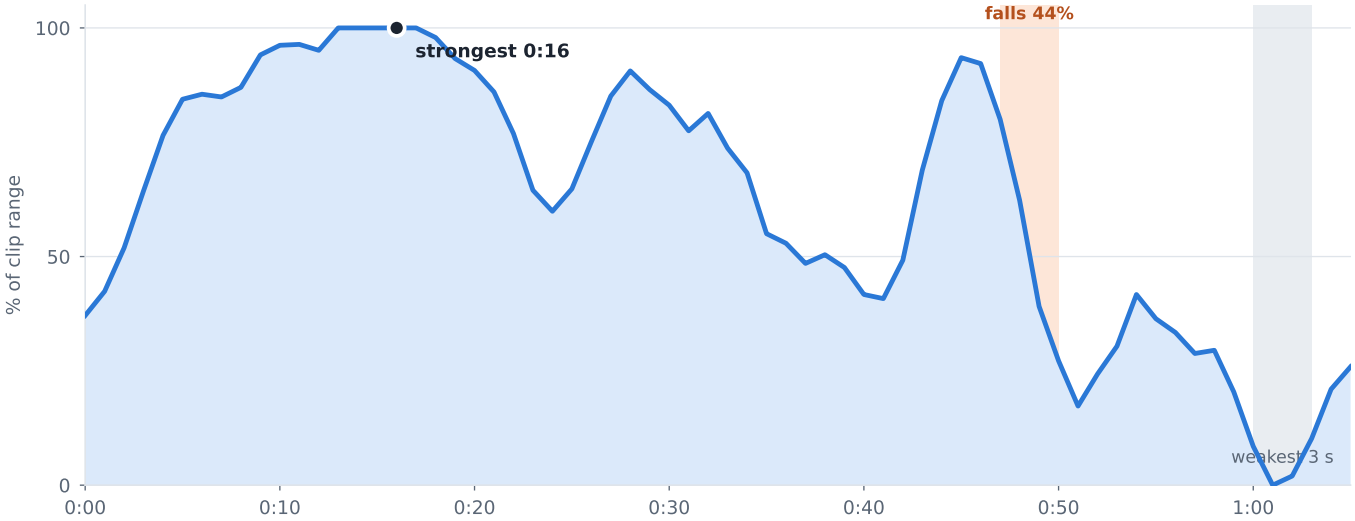
Is There Life on Mars? We Asked a NASA Scientist



STRONGEST SECOND	STEEPEST FALL	WEAKEST 3 SECONDS	AVERAGE LEVEL
0:16	**44%**	**1:00 to 1:03**	**62%**
after the first three seconds	0:47 to 0:50	lowest stretch of the curve	of this clip's own range

Predicted response across the video

Each point is one second. The scale is this clip's own range: 0 is its lowest second, 100 its highest.



What the model predicts

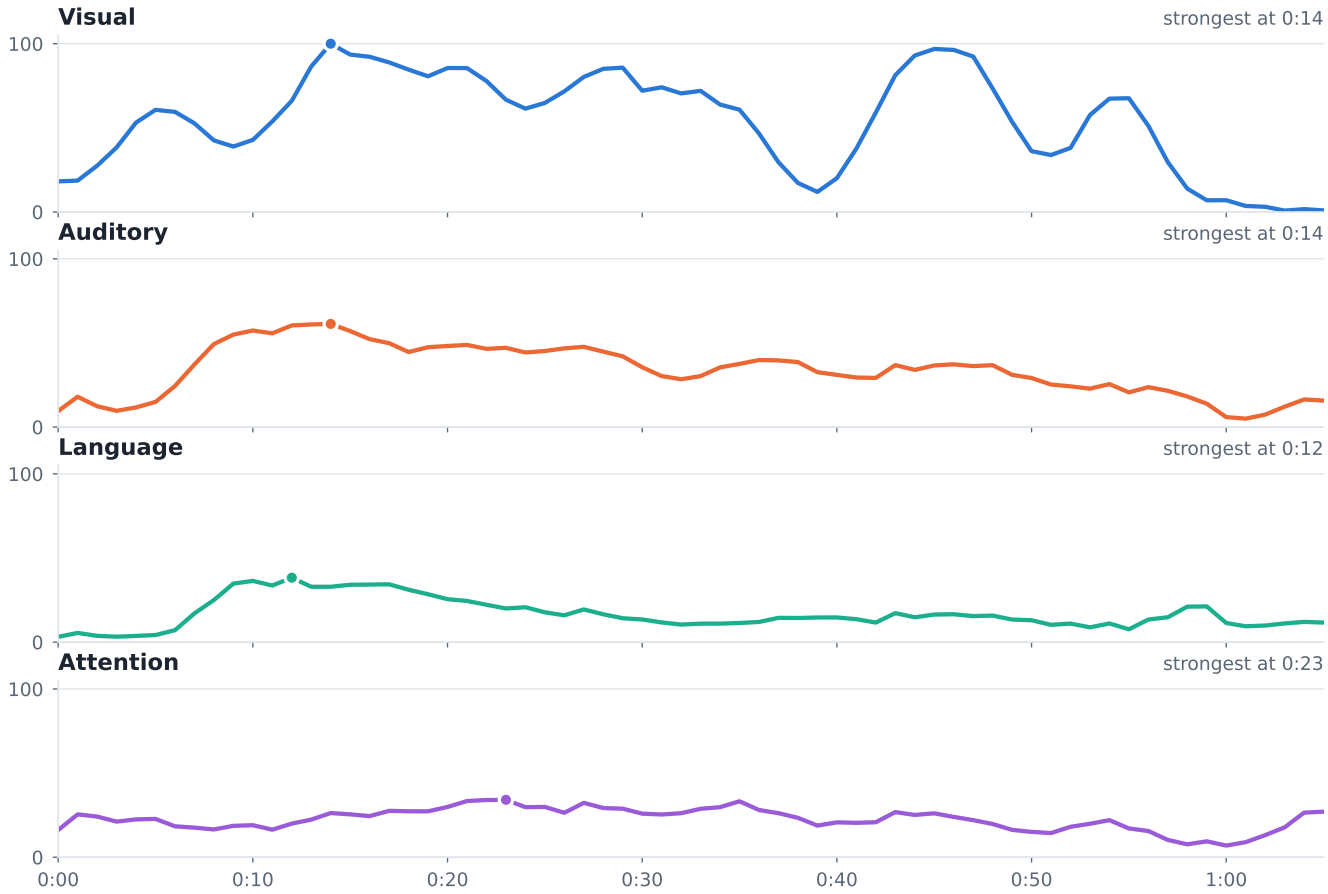
- After the first three seconds, the predicted brain response peaks at 0:16, the predicted response falls 44% between 0:47 and 0:50, and the weakest 3-second stretch is 1:00 to 1:03.
- After the fall at 0:50 the predicted response never gets back above 76% of its pre-fall level (best at 0:54); the clip's strongest moment stays 0:16.
- The visual network has the highest predicted response for 74% of the clip, the auditory network for 12%.
- Speech is present in 20% of the seconds; the words are set against the curve on the later pages.

In this report

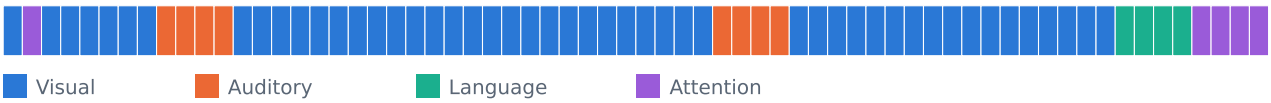
Brain networks: which of the four networks leads, and when
Key moments: the seconds worth a close look, with the frame and the words
Every second: level, leading network, most active regions and words
How to read this report: what each number is and what it is not

Brain networks

The model's cortical prediction is summarised as four networks. Each panel is scaled to that network's own range within this clip, so compare the shape and the timing of the panels, not their heights.



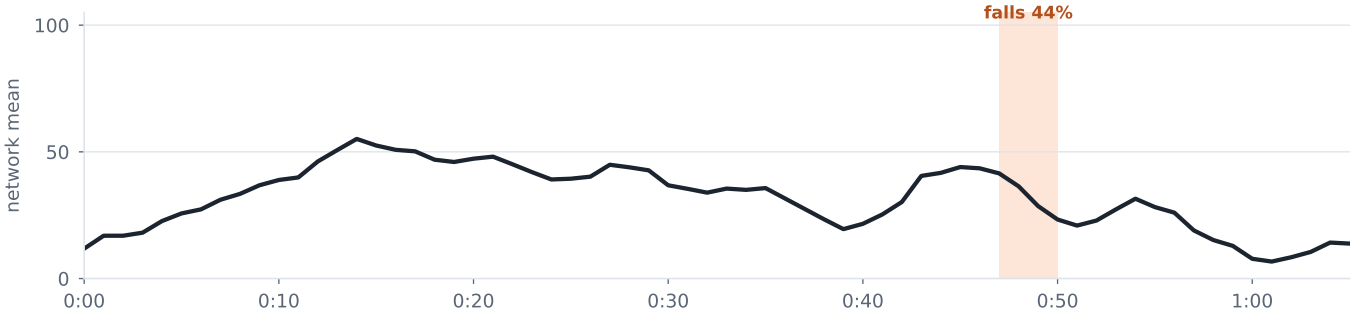
Leading network, second by second



NETWORK	LEADS FOR	SHARE OF THE CLIP	ITS STRONGEST SECOND
Visual	49 s	74%	0:14
Auditory	8 s	12%	0:14
Attention	5 s	8%	0:23
Language	4 s	6%	0:12

Mean of the four networks

This is the one series a percentage change is taken on, because it is not stretched to fill the chart. A fall is reported only when it starts at or above the clip average and loses 20% or more within three seconds.



Key moments

The seconds that define this video's predicted response. Levels are on the clip's own 0 to 100 range.



0:00 Opening

37 of 100

Leading network	Visual
System	Scene & place recognition
Regions	Ventro-medial visual (scene); Lateral intraparietal (attention/eye movements)

“Is there life on Mars?”



0:16 Strongest second

100 of 100

Leading network	Visual
System	Scene & place recognition
Regions	Ventro-medial visual (scene); Higher visual: color + face/object patches

“evidence of life now, we found lots of evidence that Mars could have supported life in the past.”



0:47 Fall begins

80 of 100

Leading network	Visual
System	Objects & color
Regions	Higher visual: color + face/object patches; Ventro-medial visual (scene)

“We're just now getting instruments onto the Martian surface that can help us understand these potentiall...

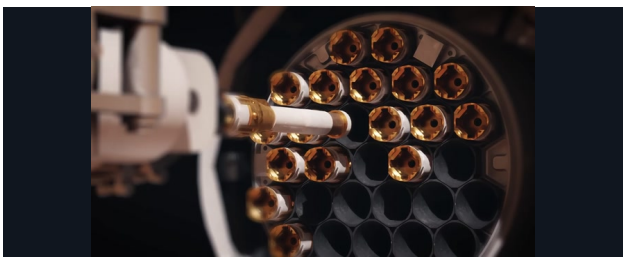


0:50 Fall ends

27 of 100

Leading network	Visual
System	Auditory cortex
Regions	Anterior superior-temporal auditory; Higher visual: color + face/object

“We're just now getting instruments onto the Martian surface that can help us understand these potentiall...



0:54 Best after the fall

42 of 100

Leading network	Visual
System	Objects & color
Regions	Higher visual: color + face/object patches; Ventro-medial visual (scene)

“And we can ask deeper questions about the potential for habitability in those rock cords.”



1:00 Weakest 3 s begin

8 of 100

Leading network	Language
System	Objects & color
Regions	Posterior inferotemporal (objects); Language network

“Not that we've found yet, but there's still a lot of Mars left to explore.”

Every second

One row per second. Level is the position on the clip's own 0 to 100 range. The strongest second is marked with a dot; rows inside the steepest fall are tinted. Words are listed at the second their line starts.

TIME	LEVEL	NETWORK	MOST ACTIVE REGIONS	WORDS	CONFID.
0:00	37	Visual	Ventro-medial visual (scene); Lateral intraparietal (attention/eye movements)	*Is there life on Mars?*	medium
0:01	42	Attention	Frontal eye fields (gaze control); Lateral intraparietal (attention/eye movements)		lower
0:02	52	Visual	Lateral intraparietal (attention/eye movements); Motion-related		lower
0:03	64	Visual	Ventro-medial visual (scene); Motion-related		medium
0:04	76	Visual	Ventro-medial visual (scene); Higher visual: color + face/object patches		medium
0:05	84	Visual	Higher visual: color + face/object patches; Lateral occipital (objects)		medium
0:06	86	Visual	Higher visual: color + face/object patches; Lateral occipital (objects)		medium
0:07	85	Visual	Lateral belt (secondary auditory); Posterior belt (secondary auditory)	*So we've been looking for life on Mars for a long time, and while NASA hasn't found any*	medium
0:08	87	Auditory	Lateral belt (secondary auditory); Posterior belt (secondary auditory)		medium
0:09	94	Auditory	Auditory area 5 (superior temporal); Posterior belt (secondary auditory)		medium
0:10	96	Auditory	Auditory area 5 (superior temporal); Posterior belt (secondary auditory)		medium
0:11	96	Auditory	Posterior belt (secondary auditory); Lateral belt (secondary auditory)		medium
0:12	95	Visual	Auditory area 5 (superior temporal); Posterior belt (secondary auditory)		medium
0:13	100	Visual	Ventro-medial visual (scene); Higher visual: color + face/object patches	*evidence of life now, we found lots of evidence that Mars could have supported life in the past.*	medium
0:14	100	Visual	Ventro-medial visual (scene); Higher visual: color + face/object patches		medium
0:15	100	Visual	Ventro-medial visual (scene); Higher visual: color + face/object patches		medium
0:16	100 ●	Visual	Ventro-medial visual (scene); Higher visual: color + face/object patches		medium
0:17	100	Visual	Ventro-medial visual (scene); Dorsal visual V3B		medium
0:18	98	Visual	Ventro-medial visual (scene); Dorsal visual V3B		medium
0:19	93	Visual	Ventro-medial visual (scene); Dorsal visual V3B	*There's lots of pieces of evidence that say there was once a huge ocean on Mars and an*	medium
0:20	91	Visual	Ventro-medial visual (scene); Dorsal visual V3B		medium
0:21	86	Visual	Ventro-medial visual (scene); Dorsal motion/form area		medium
0:22	77	Visual	Ventro-medial visual (scene); Dorsal visual V3B		medium
0:23	64	Visual	Ventro-medial visual (scene); Parahippocampal (scene)		medium
0:24	60	Visual	Ventro-medial visual (scene); Dorsal visual V3B	*atmosphere that could have supported life.*	medium
0:25	65	Visual	Ventro-medial visual (scene); Dorsal visual V3B		medium
0:26	75	Visual	Ventro-medial visual (scene); Dorsal visual V3B	*But there's still a lot of Mars left to explore.*	medium
0:27	85	Visual	Ventro-medial visual (scene); Dorsal visual V3B		medium
0:28	91	Visual	Ventro-medial visual (scene); Dorsal visual V3B		medium

Every second (continued)

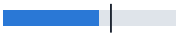
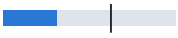
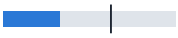
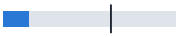
TIME	LEVEL	NETWORK	MOST ACTIVE REGIONS	WORDS	CONFID.
0:29	86	Visual	Ventro-medial visual (scene); Dorsal visual V3B	*There are places that are potentially habitable like the deep subsurface.*	medium
0:30	83	Visual	Ventro-medial visual (scene); Dorsal visual V3B		medium
0:31	78	Visual	Ventro-medial visual (scene); Dorsal visual V3B		medium
0:32	81	Visual	Ventro-medial visual (scene); Dorsal visual V3B		medium
0:33	74	Visual	Ventro-medial visual (scene); Dorsal visual V3B		medium
0:34	68	Visual	Ventro-medial visual (scene); Dorsal motion/form area	*There are places underground that could have fluids in them or organisms could live.*	medium
0:35	55	Visual	Ventro-medial visual (scene); Dorsal motion/form area		medium
0:36	53	Visual	Intraparietal sulcus (spatial attention); Dorsal motion/form area		lower
0:37	48	Auditory	Auditory area 5 (superior temporal); Posterior belt (secondary auditory)		medium
0:38	50	Auditory	Auditory area 5 (superior temporal); Auditory association cortex	*And they'd be protected from the radiation that's so harmful on the surface.*	medium
0:39	48	Auditory	Auditory area 5 (superior temporal); Auditory association cortex		medium
0:40	42	Auditory	Auditory area 5 (superior temporal); Anterior superior-temporal auditory		medium
0:41	41	Visual	Ventro-medial visual (scene); Posterior belt (secondary auditory)		medium
0:42	49	Visual	Ventro-medial visual (scene); Dorsal visual V3B	*We're just now getting instruments onto the Martian surface that can help us understand these potentially*	medium
0:43	69	Visual	Ventro-medial visual (scene); Dorsal visual V3B		medium
0:44	84	Visual	Ventro-medial visual (scene); Higher visual: color + face/object patches		medium
0:45	94	Visual	Ventro-medial visual (scene); Higher visual: color + face/object patches		medium
0:46	92	Visual	Ventro-medial visual (scene); Higher visual: color + face/object patches		medium
0:47	80	Visual	Higher visual: color + face/object patches; Ventro-medial visual (scene)		medium
0:48	62	Visual	Higher visual: color + face/object patches; Ventro-medial visual (scene)		medium
0:49	39	Visual	Higher visual: color + face/object patches; Anterior superior-temporal auditory	*And we can ask deeper questions about the potential for habitability in those rock cords.*	medium
0:50	27	Visual	Anterior superior-temporal auditory; Higher visual: color + face/object patches		medium
0:51	17	Visual	Higher visual: color + face/object patches; Anterior superior-temporal auditory		medium
0:52	24	Visual	Higher visual: color + face/object patches; Ventro-medial visual (scene)		medium
0:53	30	Visual	Higher visual: color + face/object patches; Ventro-medial visual (scene)		medium
0:54	42	Visual	Higher visual: color + face/object patches; Ventro-medial visual (scene)		medium
0:55	36	Visual	Higher visual: color + face/object patches; Ventro-medial visual (scene)	*So is there life on Mars?*	medium
0:56	33	Visual	Higher visual: color + face/object patches; Dorsal visual V3A		medium

Every second (continued)

TIME	LEVEL	NETWORK	MOST ACTIVE REGIONS	WORDS	CONFID.
0:57	29	Visual	Auditory association cortex; Auditory area 5 (superior temporal)	*Not that we've found yet, but there's still a lot of Mars left to explore.*	medium
0:58	30	Language	Auditory area 5 (superior temporal); Superior temporal sulcus (speech)		medium
0:59	20	Language	Superior temporal sulcus (speech); Auditory area 5 (superior temporal)		lower
1:00	8	Language	Posterior inferotemporal (objects); Language network		medium
1:01	0	Language	Language network; Anterior cingulate (control)		lower
1:02	2	Attention	Anterior cingulate (control); Anterior cingulate (monitoring)		lower
1:03	10	Attention	Anterior cingulate (control); Dorsolateral prefrontal (working memory / control)		lower
1:04	21	Attention	Dorsolateral prefrontal (working memory / control); Anterior cingulate (control)		lower
1:05	26	Attention	Dorsolateral prefrontal (working memory / control); Anterior cingulate (control)		lower

The words against the curve

Each spoken line with the average predicted level while it is said (clip range, 0 to 100). The clip average is 62; the tick on each bar marks it.

0:00		49	Is there life on Mars?
0:08		93	So we've been looking for life on Mars for a long time, and while NASA hasn't found any
0:13		99	evidence of life now, we found lots of evidence that Mars could have supported life in the past.
0:20		79	There's lots of pieces of evidence that say there was once a huge ocean on Mars and an
0:24		67	atmosphere that could have supported life.
0:27		84	But there's still a lot of Mars left to explore.
0:30		78	There are places that are potentially habitable like the deep subsurface.
0:34		55	There are places underground that could have fluids in them or organisms could live.
0:39		46	And they'd be protected from the radiation that's so harmful on the surface.
0:43		71	We're just now getting instruments onto the Martian surface that can help us understand these potentially habitable places.
0:50		31	And we can ask deeper questions about the potential for habitability in those rock cords.
0:56		33	So is there life on Mars?
0:58		15	Not that we've found yet, but there's still a lot of Mars left to explore.

How to read this report

What the model is

v2neuro is a brain-encoding model. It was trained on fMRI recordings of people watching video, and for a new video it predicts the response of the cortex, one value per second, from the picture, the sound and the words. Nobody watched your video for this report.

Strongest second

The second with the highest predicted response, leaving aside the first three seconds. The cortex responds to any clip starting, so the opening would win on most videos and say nothing about yours.

Level, and "of this clip's own range"

Charts and bars use a 0 to 100 scale stretched to this clip: 0 is its lowest second and 100 its highest. It shows where a second sits inside this video. It cannot be compared between two videos, and a difference between two levels is not a percentage change.

Steepest fall

The largest fall within three seconds, as a true percentage of the level it falls from, taken on the mean of the four networks without stretching. It is reported only when it starts at or above the clip average and reaches 20%. When no window qualifies the report states no percentage.

Weakest stretch

The three consecutive seconds with the lowest average level (on a clip under 15 seconds, a fifth of its length, at least one second), never the strongest second itself. Every video has one; it is the place to look first, not a fault by itself.

Networks, systems and regions

The four networks (visual, auditory, language, attention) group the cortical surface. The leading network is the one with the highest value in that second, each on its own range. Regions are the atlas areas with the highest predicted response in that second.

Confidence

Higher, medium or lower says how well the model has been shown to predict the regions that lead in that second, and how typical the second is for it. It is a guide to how much weight a row can carry.

What this is not

These are predictions of an average cortical response. They are not a measurement of your viewers and they do not forecast views, watch time or sales. On recordings held out from training, the model's predictions correlate with the measured response at about r = 0.27 for material like its training set and about r = 0.12 for very different films. The useful test is your own data: compare these moments with the numbers you already have.

neuro-viral

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