



1
00:00:02,560 --> 00:00:06,309

[Music]

2
00:00:09,750 --> 00:00:08,470

the way you and i might take a selfie is

3
00:00:11,669 --> 00:00:09,760

by holding a camera

4
00:00:13,830 --> 00:00:11,679

out with our arm and taking a single

5
00:00:20,070 --> 00:00:13,840

image the way the rover takes a selfie

6
00:00:24,070 --> 00:00:22,310

the way the rover takes a selfie is by

7
00:00:25,109 --> 00:00:24,080

using the watson camera at the end of

8
00:00:27,109 --> 00:00:25,119

the robotic arm

9
00:00:29,269 --> 00:00:27,119

but the watson camera was designed to

10
00:00:30,790 --> 00:00:29,279

take close-up images of rock for

11
00:00:33,430 --> 00:00:30,800

scientific analysis

12
00:00:35,110 --> 00:00:33,440

and even with the arm fully extended we

13
00:00:37,510 --> 00:00:35,120

can't cover the entire rover

14

00:00:39,510 --> 00:00:37,520

in a single image to capture the entire

15

00:00:41,750 --> 00:00:39,520

rover we take multiple images

16

00:00:42,549 --> 00:00:41,760

and then stitch them together in order

17

00:00:44,790 --> 00:00:42,559

to do that

18

00:00:45,990 --> 00:00:44,800

we try to hold the watson camera sensor

19

00:00:48,790 --> 00:00:46,000

in the same position

20

00:00:50,869 --> 00:00:48,800

to take the different images in order to

21

00:00:52,630 --> 00:00:50,879

keep the camera at the same position

22

00:00:54,069 --> 00:00:52,640

and take the different image frames the

23

00:00:54,709 --> 00:00:54,079

arm may actually have to move quite a

24

00:00:57,510 --> 00:00:54,719

lot

25

00:00:58,229 --> 00:00:57,520

it can take up to an hour of our motion

26

00:01:00,229 --> 00:00:58,239

and imaging

27

00:01:01,670 --> 00:01:00,239

to take that entire selfie the reason

28

00:01:04,149 --> 00:01:01,680

you don't see the robotic arm

29

00:01:05,830 --> 00:01:04,159

in the selfie is because it's moving

30

00:01:06,789 --> 00:01:05,840

between the different image frames that

31

00:01:08,950 --> 00:01:06,799

we are taking

32

00:01:10,630 --> 00:01:08,960

and we include enough overlap between

33

00:01:11,109 --> 00:01:10,640

the images so that when we stitch them

34

00:01:13,190 --> 00:01:11,119

together

35

00:01:14,950 --> 00:01:13,200

we don't have to include the arm another

36

00:01:15,429 --> 00:01:14,960

exciting first on the perseverance

37

00:01:17,429 --> 00:01:15,439

mission

38

00:01:19,590 --> 00:01:17,439

is the inclusion of microphones for the

39

00:01:20,149 --> 00:01:19,600

very first time we were able to record

40

00:01:22,469 --> 00:01:20,159

sounds

41

00:01:23,350 --> 00:01:22,479

of the arm moving as it was taking the

42

00:01:25,109 --> 00:01:23,360

selfie

43

00:01:26,950 --> 00:01:25,119

you can distinctly hear the sounds of

44

00:01:35,510 --> 00:01:26,960

the brakes on the arm actuators clicking

45

00:01:38,630 --> 00:01:38,069

and at times as the motors are changing

46

00:01:41,640 --> 00:01:38,640

speed

47

00:01:49,030 --> 00:01:41,650

it almost sounds musical like a flute

48

00:01:51,030 --> 00:01:49,040

[Music]

49

00:01:52,230 --> 00:01:51,040

when a person takes a selfie we just

50

00:01:55,109 --> 00:01:52,240

hold our arm up

51
00:01:57,030 --> 00:01:55,119
and take a single image to create the

52
00:01:58,310 --> 00:01:57,040
first persevere and selfie it took an

53
00:02:00,709 --> 00:01:58,320
entire team of people

54
00:02:01,350 --> 00:02:00,719
working together for almost an entire

55
00:02:03,670 --> 00:02:01,360
week

56
00:02:08,070 --> 00:02:03,680
in the end it took 62 images stitched