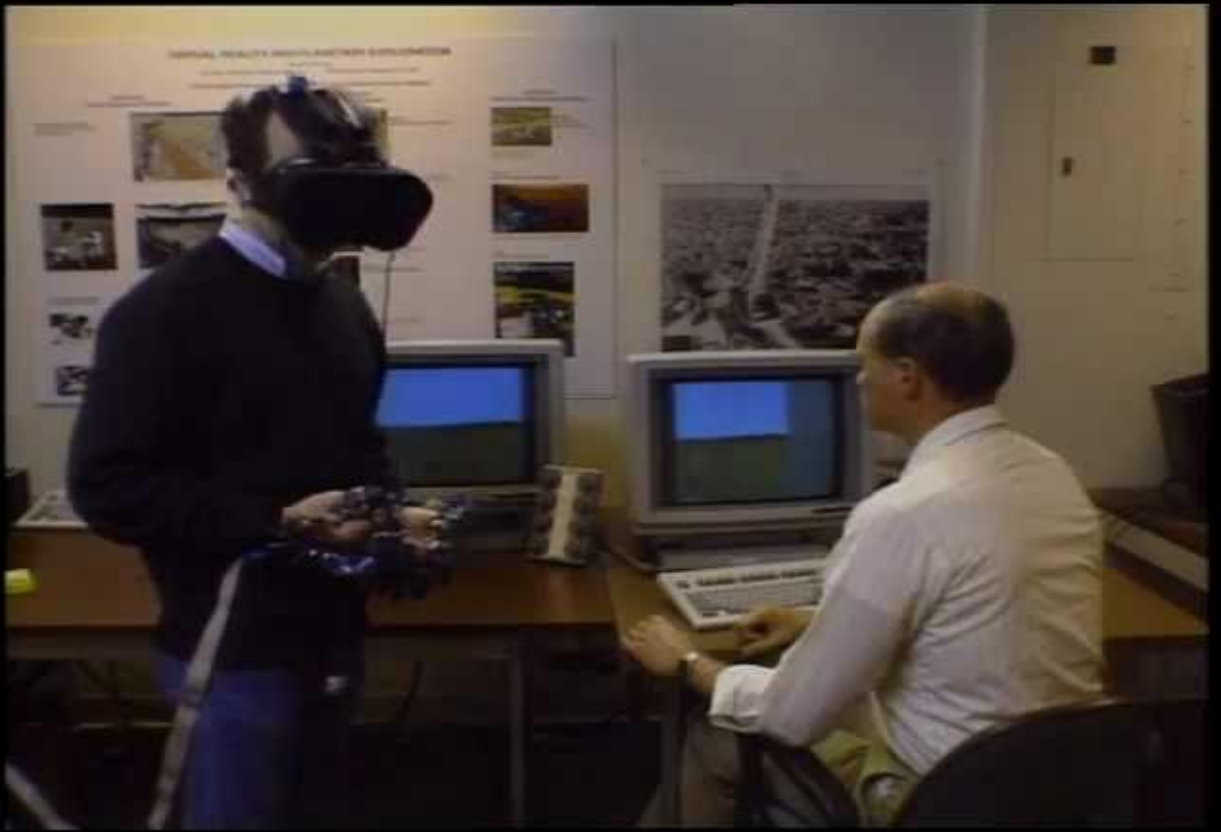

1
00:00:49,510 --> 00:00:46,549
what looks like a scene out of a science

2
00:00:51,590 --> 00:00:49,520
fiction movie is actually real

3
00:00:53,990 --> 00:00:51,600
scientists from nasa's jet propulsion

4
00:00:56,950 --> 00:00:54,000
laboratory have manipulated spacecraft

5
00:00:58,389 --> 00:00:56,960
data of venus to give a bird's-eye view

6
00:01:00,310 --> 00:00:58,399
of its surface

7
00:01:02,790 --> 00:01:00,320
venus is out there being digitized but

8
00:01:04,070 --> 00:01:02,800
this digital model this virtual reality

9
00:01:05,670 --> 00:01:04,080
of venus is what's actually being

10
00:01:08,230 --> 00:01:05,680
explored on earth

11
00:01:10,710 --> 00:01:08,240
dr michael mcgreevy of nasa's ames

12
00:01:13,590 --> 00:01:10,720
research center has taken the idea of

13
00:01:15,990 --> 00:01:13,600

being there a few steps further

14
00:01:18,710 --> 00:01:16,000
by strapping on 3d visual display

15
00:01:22,149 --> 00:01:18,720
goggles and specially censored gloves

16
00:01:25,190 --> 00:01:22,159
one can be immersed into new worlds what

17
00:01:27,590 --> 00:01:25,200
is unique about virtual reality is that

18
00:01:28,870 --> 00:01:27,600
the user has complete control over the

19
00:01:30,870 --> 00:01:28,880
environment

20
00:01:33,030 --> 00:01:30,880
head or body movements translate

21
00:01:35,270 --> 00:01:33,040
directly into the way a simulated

22
00:01:37,590 --> 00:01:35,280
martian landscape is seen

23
00:01:40,550 --> 00:01:37,600
in another example the task is to

24
00:01:43,030 --> 00:01:40,560
withdraw a square shape from its slot

25
00:01:45,749 --> 00:01:43,040
the operator's glove can be manipulated

26
00:01:47,830 --> 00:01:45,759
to control a robotic arm while sound

27
00:01:49,749 --> 00:01:47,840
cues help with depth perception and

28
00:01:52,310 --> 00:01:49,759
finding proper fit

29
00:01:53,590 --> 00:01:52,320
scientists have also designed a virtual

30
00:01:55,590 --> 00:01:53,600
wing tunnel

31
00:01:58,550 --> 00:01:55,600
the investigator can move anywhere in

32
00:02:01,190 --> 00:01:58,560
the tunnel to study airflow

33
00:02:02,709 --> 00:02:01,200
virtual reality gives the operator

34
00:02:04,550 --> 00:02:02,719
complete choice

35
00:02:07,270 --> 00:02:04,560
and is beginning to be used for a

36
00:02:10,309 --> 00:02:07,280
variety of commercial applications

37
00:02:12,150 --> 00:02:10,319
what sets nasa apart in this uh current

38
00:02:15,589 --> 00:02:12,160

climate is that we aren't looking at the

39
00:02:17,270 --> 00:02:15,599
mainstream applications uh of the this

40
00:02:19,589 --> 00:02:17,280
global activity which tend to be

41
00:02:20,949 --> 00:02:19,599
entertainment and video games we're more

42
00:02:22,949 --> 00:02:20,959
looking to how to use this for

43
00:02:24,869 --> 00:02:22,959
scientific visualization

44
00:02:26,710 --> 00:02:24,879
in particular looking at the detailed

45
00:02:28,550 --> 00:02:26,720
environments of the planets

46
00:02:31,190 --> 00:02:28,560
looking at computational fluid dynamics

47
00:02:34,309 --> 00:02:31,200
models of the air flow over a wing

48
00:02:39,910 --> 00:02:37,110
virtual reality is an idea that dates

49
00:02:41,670 --> 00:02:39,920
back to the 60s and will be commonplace

50
00:02:43,750 --> 00:02:41,680
by the next decade

51
00:02:45,750 --> 00:02:43,760
already it has been used during the gulf

52
00:02:48,390 --> 00:02:45,760
war to train tank commanders and

53
00:02:50,309 --> 00:02:48,400
soldiers the american backsled team

54
00:02:52,710 --> 00:02:50,319
owned their skills for the olympics with

55
00:02:54,949 --> 00:02:52,720
a form of virtual reality

56
00:02:57,910 --> 00:02:54,959
and the japanese have developed a system

57
00:03:00,550 --> 00:02:57,920
that allows architects to walk clients

58
00:03:02,630 --> 00:03:00,560
through a virtual building before it's

59
00:03:05,190 --> 00:03:02,640
constructed

60
00:03:07,270 --> 00:03:05,200
the dry valleys of antarctica may soon

61
00:03:08,550 --> 00:03:07,280
become a far-reaching outlet for this

62
00:03:10,470 --> 00:03:08,560
technology

63
00:03:12,470 --> 00:03:10,480

scientists have long been interested in

64
00:03:13,670 --> 00:03:12,480
the area because it is so similar to

65
00:03:16,070 --> 00:03:13,680
mars

66
00:03:18,390 --> 00:03:16,080
its frozen lakes contain primitive

67
00:03:20,869 --> 00:03:18,400
microbial gnats that live in the water

68
00:03:23,110 --> 00:03:20,879
below many feet of ice

69
00:03:25,750 --> 00:03:23,120
researchers at nasa ames are planning to

70
00:03:28,789 --> 00:03:25,760
use a form of virtual reality called

71
00:03:31,110 --> 00:03:28,799
telepresence to operate a remote imaging

72
00:03:32,789 --> 00:03:31,120
and sampling vehicle to explore this

73
00:03:35,670 --> 00:03:32,799
bizarre world

74
00:03:38,710 --> 00:03:35,680
dr carol stoker leads this effort

75
00:03:41,110 --> 00:03:38,720
with telepresence we think that that we

76
00:03:43,030 --> 00:03:41,120
can really expand the range of access to

77
00:03:45,430 --> 00:03:43,040
the surface of mars from a scientific

78
00:03:48,309 --> 00:03:45,440
perspective not just in terms of

79
00:03:49,910 --> 00:03:48,319
operating you know relatively uh simple

80
00:03:51,990 --> 00:03:49,920
robots to do things like construction

81
00:03:52,869 --> 00:03:52,000
but but really to do scientific field

82
00:03:55,589 --> 00:03:52,879
work

83
00:03:58,229 --> 00:03:55,599
the potential of virtual reality and

84
00:04:00,789 --> 00:03:58,239
telepresence and planetary exploration

85
00:04:03,190 --> 00:04:00,799
is very promising and earthly

86
00:04:24,310 --> 00:04:03,200
applications derived from this research

87
00:04:24,320 --> 00:04:29,430
hmm

88
00:04:32,390 --> 00:04:31,189

so you're going to reach out and

89
00:04:35,110 --> 00:04:32,400
pop up the

90
00:04:38,629 --> 00:04:35,120
visual scene right yeah i'll use the um

91
00:04:40,469 --> 00:04:38,639
the exos d iconifier

92
00:04:42,950 --> 00:04:40,479
okay

93
00:04:45,350 --> 00:04:42,960
let's get this window right here the

94
00:04:46,310 --> 00:04:45,360
icon five good and let's get this window

95
00:04:48,629 --> 00:04:46,320
vehicle

96
00:04:50,150 --> 00:04:48,639
because one is to measure the gestures

97
00:04:51,590 --> 00:04:50,160
of our

98
00:04:54,790 --> 00:04:51,600
folks in the field

99
00:04:56,469 --> 00:04:54,800
and also to transmit those gestures into

100
00:05:18,550 --> 00:04:56,479
the virtual environment and into the

101
00:05:22,550 --> 00:05:20,550
is the ability to reach down and grab

102
00:05:24,550 --> 00:05:22,560
that rock right there

103
00:05:25,830 --> 00:05:24,560
pick up a piece of that rock

104
00:05:28,150 --> 00:05:25,840
look at it

105
00:05:30,629 --> 00:05:28,160
to check for the glitz and then to take

106
00:05:32,710 --> 00:05:30,639
it and put it into your pack

107
00:05:34,550 --> 00:05:32,720
extract it out that one sort of small

108
00:05:36,390 --> 00:05:34,560
area oh is that right here the walk