1
00:00:21,200 --> 00:00:18,950
every good group of retirees gets

2
00:00:24,410 --> 00:00:21,210
together at brookside golf course in Los

3
00:00:26,570 --> 00:00:24,420
Angeles California bill graham has been

4
00:00:29,359 --> 00:00:26,580
a golfer for years and is used to

5
00:00:32,870 --> 00:00:29,369
playing with handicaps but he now plays

6
00:00:35,299 --> 00:00:32,880
with a different kind a severe loss of

7
00:00:38,959 --> 00:00:35,309
central vision caused by age-related

8
00:00:41,150 --> 00:00:38,969
macular degeneration the disease's

9
00:00:43,970 --> 00:00:41,160
claimed a center portion of his eyesight

10
00:00:46,760 --> 00:00:43,980
we're fine details are recognized before

11
00:00:50,660 --> 00:00:46,770
the condition of X 1 out of 5 americans

12
00:00:54,119 --> 00:00:50,670
over the age of 75 right there

13
00:00:57,150 --> 00:00:54,129

at the first team a friend helps line up

14
00:00:59,910 --> 00:00:57,160
the shot bill has to rely upon his

15
00:01:05,650 --> 00:00:59,920
peripheral vision he sees something like

16
00:01:10,280 --> 00:01:08,270
every day activities like crossing a

17
00:01:12,950 --> 00:01:10,290
busy intersection are difficult with

18
00:01:16,190 --> 00:01:12,960
macular degeneration and reading a

19
00:01:18,650 --> 00:01:16,200
newspaper is nearly impossible to date

20
00:01:21,410 --> 00:01:18,660
there is no cure for the disease just

21
00:01:23,330 --> 00:01:21,420
measures to keep it in check but dr.

22
00:01:26,690 --> 00:01:23,340
Terry Lawton of NASA's Jet Propulsion

23
00:01:29,300 --> 00:01:26,700
Laboratory in Pasadena California is

24
00:01:31,790 --> 00:01:29,310
working on an image filtering technique

25
00:01:33,530 --> 00:01:31,800
next that helps people read it's

26
00:01:35,390 --> 00:01:33,540
something people aren't used to doing

27
00:01:37,400 --> 00:01:35,400
looking off to the side to be able to

28
00:01:40,940 --> 00:01:37,410
read but that's where their best vision

29
00:01:42,730 --> 00:01:40,950
is now and these filters make it so that

30
00:01:45,590 --> 00:01:42,740
they can read two or four times faster

31
00:01:48,890 --> 00:01:45,600
this is an example of an unfiltered

32
00:01:51,770 --> 00:01:48,900
versus of filtered word using a closed

33
00:01:54,140 --> 00:01:51,780
circuit viewer dr. Lawton measures the

34
00:01:56,630 --> 00:01:54,150
number of correct responses given by mr.

35
00:02:00,440 --> 00:01:56,640
Graham during a test that mixes filtered

36
00:02:04,790 --> 00:02:00,450
and unfiltered sentences the dogs swam

37
00:02:06,920 --> 00:02:04,800
in the water and played all day the

38
00:02:09,530 --> 00:02:06,930

digitally processed words actually

39
00:02:12,199 --> 00:02:09,540
appear less readable for someone with

40
00:02:14,600 --> 00:02:12,209
normal sight the reality is it is more

41
00:02:17,510 --> 00:02:14,610
blurred where terlatin is doing is not

42
00:02:19,760 --> 00:02:17,520
creating a crisp sharp edge but with her

43
00:02:22,670 --> 00:02:19,770
filters she's creating enhancement of

44
00:02:24,260 --> 00:02:22,680
contrast and even though you don't need

45
00:02:26,420 --> 00:02:24,270
that enhancement so you see the blurring

46
00:02:28,940 --> 00:02:26,430
that she's creating the person who has

47
00:02:30,199 --> 00:02:28,950
certain losses needs the contrast more

48
00:02:32,720 --> 00:02:30,209
than they need a sharpness of the edge

49
00:02:34,460 --> 00:02:32,730
and they see better with this I want you

50
00:02:37,160 --> 00:02:34,470
to tell me each one of these circles

51
00:02:40,009 --> 00:02:37,170
standard I testing until recently never

52
00:02:42,740 --> 00:02:40,019
measured an individual sensitivity to

53
00:02:46,130 --> 00:02:42,750
contrast which is how well various

54
00:02:47,810 --> 00:02:46,140
patterns are seen from light to dark dr.

55
00:02:51,380 --> 00:02:47,820
Lawton has developed the system that

56
00:02:53,390 --> 00:02:51,390
very accurately measures this ability by

57
00:02:55,370 --> 00:02:53,400
hitting buttons mr. Graham tells a

58
00:02:58,280 --> 00:02:55,380
computer whether he sees the pattern on

59
00:03:01,070 --> 00:02:58,290
a screen slant to the right or left the

60
00:03:03,590 --> 00:03:01,080
technology pinpoints his best level of

61
00:03:06,050 --> 00:03:03,600
contrast sensitivity which then gets

62
00:03:09,050 --> 00:03:06,060
translated into the way words are shaded

63
00:03:10,910 --> 00:03:09,060

or filtered eventually closed circuit

64
00:03:13,070 --> 00:03:10,920
viewers will be on the market that

65
00:03:16,280 --> 00:03:13,080
magnify and filter words

66
00:03:20,750 --> 00:03:16,290
with a long did Jules contrast that to

67
00:03:23,270 --> 00:03:20,760
hear the birch as a result of the

68
00:03:25,640 --> 00:03:23,280
research dr. Lawton sees potential in

69
00:03:29,750 --> 00:03:25,650
using this image processing technique

70
00:03:31,880 --> 00:03:29,760
for a future Mars rover vision system it

71
00:03:34,550 --> 00:03:31,890
would assist in negotiating Boulder

72
00:03:37,730 --> 00:03:34,560
fields such as this photographed by an

73
00:03:40,250 --> 00:03:37,740
early Martian probe called Viking the

74
00:03:42,170 --> 00:03:40,260
filtering acts to highlight individual

75
00:03:44,510 --> 00:03:42,180
boulders in the same way it uses

76
00:03:47,300 --> 00:03:44,520
contrast to emphasize the shape of

77
00:03:51,800 --> 00:03:47,310
letters in a word thus pinpointing

78
00:03:55,040 --> 00:03:51,810
obstacles for the rover to avoid NASA's

79
00:03:58,820 --> 00:03:55,050
human factors research and its ties to