1
00:00:01,436 --> 00:00:06,726
[Lynnette Madison] We're here today with
Corey Simon who is an Interface Engineer,

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00:00:06,726 --> 00:00:08,836
Human Interface Engineer, right Corey?

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00:00:09,186 --> 00:00:09,436
[Corey Simon] That's right.

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00:00:09,436 --> 00:00:11,546
[Lynnette] Okay, so Corey is
going to tell us a little bit

5
00:00:11,546 --> 00:00:18,006
about how wearable technology can work for
NASA as we create futuristic spacesuits.

6
00:00:18,466 --> 00:00:23,046
Now Corey I, this doesn't really
look like the suit that Ironman dons.

7
00:00:23,716 --> 00:00:27,266
So how will something like
this translate to a spacesuit

8
00:00:27,266 --> 00:00:29,896
or what's the importance of human interface?

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00:00:30,156 --> 00:00:32,326
[Corey] Well, we're getting to the Ironman suit.

10
00:00:32,816 --> 00:00:39,946
Wearable technology, at least in these, kind of
early stages of the technology and development,

11
00:00:40,326 --> 00:00:46,236
is really focused on putting sensors, displays
and controls on to an astronaut's body.

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00:00:46,496 --> 00:00:49,836
We're focused on inside the,
inside the space habitat

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00:00:49,836 --> 00:00:54,096
so that they can perform additional
functions, really augment their capability.

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00:00:54,366 --> 00:00:58,266
To allow them to reach things that they
couldn't reach through the controls on the body,

15
00:00:58,296 --> 00:01:00,606
to see things that they couldn't see.

16
00:01:01,206 --> 00:01:02,966
[Lynnette] Okay, elaborate a little bit more.

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00:01:02,966 --> 00:01:03,706
I don't understand.

18
00:01:03,996 --> 00:01:05,976
How can they do that with these sensors?

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00:01:06,356 --> 00:01:11,526
[Corey] So this garment here was made by
students at the University of Minnesota.

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00:01:11,526 --> 00:01:18,076
We asked them to help us work on, how
can we attach and remove functionality

21
00:01:18,166 --> 00:01:22,406
from our garments so that we can have a single
garment that has a diverse set of capabilities.

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00:01:22,716 --> 00:01:27,616
In this case they created several

attachment points where functional swatches

23
00:01:27,616 --> 00:01:32,786
of fabric could be attached and removed whether
they be a sensor, or maybe something as simple

24
00:01:32,786 --> 00:01:38,376
as a push button control, or an LED light, or
more complex communications, maybe a speaker

25
00:01:38,376 --> 00:01:41,456
and a microphone or a gas analyzer sensors.

26
00:01:41,456 --> 00:01:44,976
Things like that, that allow the
astronaut to carry these displays,

27
00:01:44,976 --> 00:01:47,196
controls and sensors with them as they operate.

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00:01:47,746 --> 00:01:51,696
[Lynnette] And so this will make them be able to
get around the space station a little bit easier

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00:01:51,696 --> 00:01:55,646
or perhaps on another planet so they
can carry all these things on them?

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00:01:55,796 --> 00:01:56,446
[Corey] Absolutely.

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00:01:56,446 --> 00:01:59,556
We're really looking at bringing
this to the astronauts

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00:02:00,166 --> 00:02:02,186
in a habitable volume wherever they might be.

33
00:02:02,556 --> 00:02:07,966

And the real benefit of this is we're
bringing information to the astronaut.

34
00:02:07,966 --> 00:02:12,396
We'll have displays that they can feel
on their skin called tactile feedback.

35
00:02:12,396 --> 00:02:17,216
We'll have visual displays and audio displays
that will allow them to gather information

36
00:02:17,556 --> 00:02:25,316
about the spacecraft and then also controls that
will let them change how the spacecraft operates

37
00:02:25,556 --> 00:02:27,016
from anywhere they are wirelessly.

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00:02:27,486 --> 00:02:29,636
[Lynnette] So like a computer on your sleeve?

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00:02:29,636 --> 00:02:30,846
[Corey] That's the idea.

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00:02:30,846 --> 00:02:35,196
They call it wearable computing and
functional technology or smart fabrics.

41
00:02:35,896 --> 00:02:37,136
[Lynnette] Why fashion design?

42
00:02:37,136 --> 00:02:40,516
You went to an apparel design class
at the University of Minnesota.

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00:02:40,516 --> 00:02:41,736
How did you find the class?

44
00:02:42,096 --> 00:02:44,126

And why fashion design, not engineering?

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00:02:44,296 --> 00:02:48,796
[Corey] So we asked the students through their
professor Dr. Lucy Dunne at the University

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00:02:48,796 --> 00:02:52,556
of Minnesota to help us out with some
of these problems because in my group,

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00:02:52,556 --> 00:02:55,866
the Human Interface Group, we're
really focused on Avionics.

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00:02:55,866 --> 00:03:02,236
We're focused on hardware capabilities and
display capabilities and those sorts of things.

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00:03:02,236 --> 00:03:05,506
So we're more concerned with the physical
aspect and how the technology functions.

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00:03:06,016 --> 00:03:09,596
We have other folks at Johnson Space
Center who work on human factors

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00:03:09,596 --> 00:03:10,986
and do research and things like that.

52
00:03:11,636 --> 00:03:14,986
But we really went to University
of Minnesota and the students there

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00:03:15,446 --> 00:03:18,066
to leverage their expertise in
garment design and you can see here,

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00:03:18,066 --> 00:03:22,496
and there are several other
prototypes that have been developed.

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00:03:22,956 --> 00:03:26,086
Their expertise is really, it really
shines through and it's something

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00:03:26,086 --> 00:03:29,036
that we're really going to be
able to leverage as we go forward

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00:03:29,036 --> 00:03:30,626
and continue to develop this technology.

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00:03:31,406 --> 00:03:35,456
[Lynnette] So what are, how many years have
you worked with the University of Minnesota?

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00:03:35,796 --> 00:03:36,536
[Corey] We just started.

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00:03:36,656 --> 00:03:37,936
[Lynnette] So this is your first time then?

61
00:03:37,936 --> 00:03:38,146
[Corey] Yeah.

62
00:03:38,176 --> 00:03:40,766
This is our first time through and we've
been very happy with what they've produced.

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00:03:40,996 --> 00:03:43,856
[Lynnette] So you're looking forward
to next semester, to see what...

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00:03:44,016 --> 00:03:44,666
[Corey] We are.

65
00:03:44,856 --> 00:03:46,336
They worked very hard on this.

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00:03:46,336 --> 00:03:48,306
I'm wondering how many of
them will sign up again.

67
00:03:49,176 --> 00:03:52,766
But we're very happy with what they've produced
and yes, we're definitely looking forward

68
00:03:52,766 --> 00:03:54,866
to working with them again and
other universities as well.

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00:03:55,146 --> 00:03:59,626
[Lynnette] So what's the next step on designing
something for an astronaut on the space station?

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00:03:59,626 --> 00:04:02,026
And are you also looking at,
not just the space station,

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00:04:02,026 --> 00:04:05,206
are you looking towards the next step
what we're going to do in the future

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00:04:05,206 --> 00:04:06,886
when go to an asteroid or to Mars?

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00:04:06,976 --> 00:04:07,216
[Corey] Yes.

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00:04:07,276 --> 00:04:10,916
Absolutely, one of the nice things about
a garment specifically like this is

75
00:04:11,196 --> 00:04:13,696
that when you can attach and remove
this functionality it allows us

76
00:04:13,746 --> 00:04:19,196

to use a rapid prototyping mentality where
we can, we can test a wearable function

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00:04:19,196 --> 00:04:22,986
where we put it on the body, we remove
it, we try it at different locations.

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00:04:23,366 --> 00:04:27,016
And then operationally when we
get to the point where we put this

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00:04:27,016 --> 00:04:30,526
on the space station or on a future habitat.

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00:04:31,106 --> 00:04:36,076
We'll have refined it iteratively with
different swatches and different garments

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00:04:36,346 --> 00:04:39,856
so that hopefully we'll, we'll
have a very functional garment

82
00:04:39,856 --> 00:04:43,156
that really allows the astronauts
to act more efficiently

83
00:04:43,376 --> 00:04:46,656
and really be enabled more so than they are now.

84
00:04:46,966 --> 00:04:48,396
[Lynnette] Anything else
that you got out of class?

85
00:04:48,396 --> 00:04:52,066
I think you're getting a couple
of interns next semester right?

86
00:04:52,066 --> 00:04:53,216
[Corey] That's absolutely right.

87
00:04:53,736 --> 00:04:56,256
We've been so happy with their work
we've asked them to come work for us.

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00:04:56,696 --> 00:05:01,126
[Lynnette] And are you're going to expand
this to other classes or to other schools?

89
00:05:01,866 --> 00:05:02,176
[Corey] Yep.

90
00:05:02,176 --> 00:05:02,726
Absolutely.

91
00:05:02,726 --> 00:05:04,666
We're talking to other schools right now.

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00:05:04,666 --> 00:05:08,016
We want to continue our relationship
with the University of Minnesota,

93
00:05:08,016 --> 00:05:10,966
but there's a lot of expertise
out there that we can leverage

94
00:05:10,966 --> 00:05:12,456
and a lot of students with creative ideas.

95
00:05:13,136 --> 00:05:15,176
[Lynnette] So fashion design now, right,

96
00:05:15,296 --> 00:05:18,526
is Human Interface plus fashion
design so that it looks good.

97
00:05:18,526 --> 00:05:19,566
It works good.

98

00:05:19,566 --> 00:05:22,016
You have a wearable computer.

99
00:05:22,016 --> 00:05:22,276
[Corey] Yep.

100
00:05:22,496 --> 00:05:23,866
[Lynnette] Everything is great, right?

101
00:05:23,866 --> 00:05:24,086
[Corey] Yep.

102
00:05:24,226 --> 00:05:26,406
Coming to a supermarket near you.

103
00:05:27,726 --> 00:05:30,646
[Lynnette] Well thank you very much Corey
for telling us about Human Interface

104
00:05:30,696 --> 00:05:36,706
and wearable computers and I'm looking
forward to maybe not having that Ironman suit,

105
00:05:36,706 --> 00:05:41,396
power suit in my closet, but I think
maybe something with attachments sort

106
00:05:41,396 --> 00:05:43,416
of like a computer on my sleeve might be good.