
ENGINEER TRAINS
SPACECRAFT TO
CRASH ITSELF
INTO AN
ASTEROID

1
00:00:01,001 --> 00:00:08,008
Never in my life would I have thought I would take a couple hundred million dollar spacecraft and crash it into a

2
00:00:08,908 --> 00:00:17,183
My name is Michelle Chen and I lead the team that is responsible for the autonomous navigation of DART spac

3
00:00:17,384 --> 00:00:21,221
The DART mission is the first planetary defense test mission.

4
00:00:21,221 --> 00:00:26,526
Our goal is to hit and impact an asteroid to understand and study the momentum transfer

5
00:00:26,526 --> 00:00:32,465
so that we could potentially later down the road if we need to deflect an asteroid on its way to Earth.

6
00:00:32,465 --> 00:00:33,900
I am the SMART Nav lead.

7
00:00:34,200 --> 00:00:38,638
SMART Nav stands for Small-body Maneuvering Autonomous Real-Time Navigation.

8
00:00:38,638 --> 00:00:41,608
SMART Nav, I always consider it sort of like the brains.

9
00:00:41,708 --> 00:00:44,978
And so, the camera, DRACO, is essentially the eyes.

10
00:00:44,978 --> 00:00:51,051
The algorithm has to identify and hit the target in the field of view of the camera.

11
00:00:51,051 --> 00:00:54,287
We're flying at over six kilometers a second.

12
00:00:54,287 --> 00:00:59,359
It essentially occupies a pixel up until possibly thirty minutes prior to impact.

13
00:00:59,359 --> 00:01:02,028

And then that's where everything gets really exciting

14
00:01:02,095 --> 00:01:05,498
And so you could just imagine if it was a human being joysticking this.

15
00:01:05,598 --> 00:01:08,968
Because we don't know for sure what the asteroids look like,

16
00:01:08,968 --> 00:01:15,408
our simulation gives us the capability to use different asteroid shapes and asteroid objects

17
00:01:15,408 --> 00:01:20,613
to see that our SMART Nav algorithm performs against all these unknowns.

18
00:01:20,613 --> 00:01:23,583
We're super excited and nervous as well.

19
00:01:23,583 --> 00:01:28,988
I love pushing the boundaries and I love the application of math into real-world problems.