- [Narrator] Self-checkout,

food delivery robots,

entirely automated assembly lines,

robots have been **encroaching**(вторжение) on human led jobs for decades.

But now more autonomous workers are being welcomed

into businesses than ever before.

- We're getting machines in general,

the ability to sense.

We're combining those senses

with new and better forms of artificial intelligence.

- One of the **hallmarks**(отличительные черты) of the COVID crisis

and its **aftermath**(последствие).

There's going to be an acceleration

of the deployment of all kinds

of automation. - So, what does this mean

for the future of the American worker?

At one FedEx shipping hub in Memphis, Tennessee,

it means working with robot pickers.

- FedEx is using

these robot arms combined

with an AI vision and **gripping system**(система захвата),

in order to one for one,

replace a human who would normally be picking up packages

from one place and putting it onto a conveyor belt.

- This so-called pick step is the single most common job

at E-commerce **fulfillment**(реализация) companies like Amazon.

And it's been considered one

of the hardest jobs

to automate. - It's really been

the Holy Grail for robotics engineers

and artificial intelligence specialists

because it turns out that combination

of our vision and our flexibility

and our **dexterity**(сноровка) is the one thing

that you really can't replace in a warehouse.

But these robots are starting to encroach(вторгаться на территорию)

on that territory. - The effort

to reduce human contact at work has accelerated automation

in other industries as well.

Temperature checking robots

and mask detecting sensors are policing airports.

Cleaning bots are sanitizing hospital rooms and outbreaks

at meat processing plants have companies racing

to develop robot butchers. - Industrial robots,

have been around since really the late 1950s.

But they couldn't see

and they couldn't sense their environment.

It made them very dangerous,

very strong,

very **precise**(точный),

but they had no adaptability.

They could only do the same task over and over again.

A lot of the most **spectacular**(впечатляющий) work

that's been done in the past five,

10 years has all been in terms of vision systems.

When you give robots the ability to see,

suddenly if an object is not in the place

that they're expecting it

they can **adjust**(настраивать) and move and grab it just like we do.

- These robots combine hardware like cameras

and sensors with some form of machine learning software,

like the artificial intelligence systems

that allow for partial self-driving

in a Tesla. - And so, once you have

a system that is trained

to recognize certain objects or features of objects,

then it can very consistently

and very quickly look at a scene

and in real time,

say like that's a person,

that's a face,

that's who sees this is.

Or this is a package and this is

how I should grab it. - Right now,

FedEx has four robot pickers.

Each is half as fast as a human picker.

But FedEx says they'll become faster

once lessons learned during this pilot phase are put

into practice.

**Human oversight**(человеческий контроль) is still needed to help

with **sporadic**(случайные) obstacles like

a fallen package blocking a sensor.

But FedEx says those **snags**(сучки) are rare enough

that one human can simultaneously oversee eight robots.

- And because these robots can work 24/7

and they're consistent(совместимый) it's okay

that they're a little bit slower

than humans. - Even so, there's good reason shipping warehouse workers

shouldn't feel threatened by their co-bots just yet.

Demand for home delivery services is exploding

across the industry.

UPS says it's average daily shipping volume rose faster

this last quarter than ever.

FedEx says it can't hire fast enough

and is short around 500 human positions

a night at the same shipping hub that's home

to its robot pickers. - Amazon has invested heavily

in automation technologies

and even buying companies that do

a warehouse automation.

So that's clearly front and center.

It's, doesn't seem like it's winnowing

the head count because there's such a growth

in demand. - Mark Muro,

has been analyzing the intersection of regional economies

and technology for decades.

And while he agrees

that demand is protecting fulfillment industry jobs for now,

he cautions that similar types of work

in other industries are not as safe.

- People in routine,

non-essential jobs have probably been laid

off now and probably would be right

to be very concerned about where they will be hired next.

- [Narrator] And not just because

of workplaces transformed by social distancing

or robots transformed by sophisticated AI.

But also,

it's looking like we're on

the brink of a global recession.

- Companies are looking

for new processes and cheaper ways

of delivering goods and services.

So, they actually sign up for more automation

not less in downturns. - Just giving a machine

the ability to not just sense its environment

but make sense of that information

in some way to identify

where is my goal gives all kinds of robotics

these abilities to do things

that before were really just

the domain of humans

or maybe animals. - In the last decade,

a lot of these technologies became ready

for prime time.

And this is prime time now

so I do think we'll see much more accelerated automation.