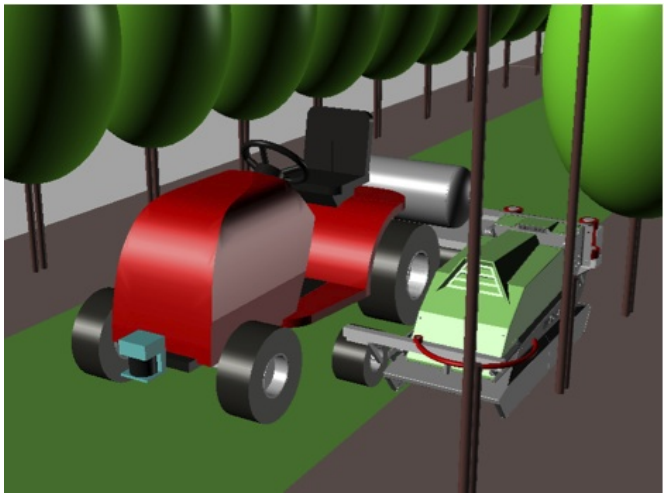
Mims's Bits

Down on the Farm, Will Robots Replace Immigrant Labor?

You'd think that the most challenging, lowest-paid labor in the U.S. was safe from automation, but as robots become increasingly sophisticated, that could change.

CHRISTOPHER MIMS 08/30/2011

3 COMMENTS



The ASuBot is an experimental platform for automatically tending orchards

A quick search of Google Scholar will reveal that the engineering literature is home to more papers on agricultural robots than ever. The majority are from China, which might seem strange given the historically low cost of labor there.

But times are changing: Foxconn, the electronics manufacturer famous for building Apple products as well as worker suicide, is moving to incorporate one million robots into its assembly lines in just three years. Wages are rising in China, as are the demands of workers. In an age in which increasingly complex tasks can be performed by semi-autonomous machines, robots have become the ultimate scabs.

Down on the farm, it's no different. Industrial agriculture has already simplified the otherwise topographically complicated landscape a robot must navigate. Orchards, after all, have been planted in regular rows for centuries.

The same technology that allows for self-driving cars is driving this nascent revolution. These advances include optical range-finding technology like LIDAR, which can give robots the equivalent of human visual acuity and even better depth perception.

Another important ingredient, according to an abstract just submitted to the Automation and System Technology in Plant production conference of the Nordic Association of Agricultural Scientists, is the open-sourcing of robot control software and hardware.

Using FroboMind software, which runs on top of the open-source Robot Operating System from Willow Garage, researchers were able to drive the FroboBox, a straightforward Debin Linux-powered computer whose flexible outputs can be used to drive almost any kind of automate-able farm machinery.

In one particular application, the FroboBox drove an experimental ASuBot, which is kind of like a self-driving riding lawnmower. Here's a video of it in action.

BIO

Christopher Mims is a journalist who covers technology and science for just about everybody.

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As we've seen in countless other areas of software development, the more the details of a system can be abstracted away through the use of robust, open-source components, the more time programmers and engineers have to actually build something that works. Just as Apache and HTML made the web possible, it appears that the Robot Operating System and platforms built with it are allowing researchers to move past theory and into the real world.

But at what point do robots become cheaper than migrant labor? That depends: in Denmark, where the FroboMind is being pioneered, labor costs are substantially higher than in the U.S. China has an incentive to move up the value chain in addition to dealing with its own rising wages, so, as in clean energy, its engineers have an interest in creating products for export. In any country, when capital is cheaper than labor -- that's when we'll see devices like these roll out.

Send Leon Larsen.

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patnclaire
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97 DAYS AGO | 08/30/2011

One size fits all

Components of agra-robots exist now. There is code to drive vehicles down city streets with traffic lights and parked cars and pedestrians and bouncing balls from between parked cars. There is the DARPA contest to build autonomous vehicles that travel through the desert for some miles. The AI software is getting better all the time. What is needed is systems of systems engineers with interoperability expertise…and a well-defined set of limited requirements. For the foreseeable future, one sized robots that fits all will have to wait.

REPLY


Kevn73
26 Comments

96 DAYS AGO | 08/31/2011

It's just a matter of time.

Local area or differential GPS solutions are ideal for farms. An enclosed well-defined area easy to map and rarely changes. The technology is not new, it's mature, and it's widely available. The cost of integration is the only thing holding back most farm owners from switching over. But, as we know, technology does two things very very well, it gets better and it gets cheaper. So I feel it's just a matter of time before farmers will roboticize every part of their workforce that can be.

REPLY


erbium
307 Comments

88 DAYS AGO | 09/08/2011

European automation

We had a talk by a major grower at our club. He toured europe growers. One theme many had in common: huge indoor grow areas, with almost no employees other than family.

This is for two reasons:
if they make money but don't invest it in the business, it gets largely taxed away. So if they invest in automation systems they increase productivity and keep the money in the form of the capital goods.

if they hire someone, they are next to impossible to let go, and cost quite a bit - in

france they have under 40 hour work weeks mandatory and 7 week vacations. I'm sure payroll taxes, etc are much higher.

So it seems like in europe people have been priced out of some labor markets.

robotics for agriculture is not simple. sure tractors have gps now and can be very sophisticated. however crop pickers, and plant tenders outdoors have to be very complex to replace people. and increasingly there are indoors crops - the baby lettuces found many markets, and greenhouse tomatoes are one example. the lettuce grow on a slowly moving river pond of hydroponics. the tommies have to be tied up to strings, clipped and tended in the vast greenhouses. the first is designed to need few people and engineered automation rather than robotics, the second would be hard for robots to do.

REPLY