

Robotics and Real-time Control

ROBOTS AND PEOPLE

A question of serious concern when considering introducing robots into factories and other environments is the effect of the new technology on people's jobs. Will the robots displace people, taking over comparatively unskilled work, and leaving many unemployable? Or will they be used only for work which people would prefer not to do, and thereby release humanity from drudgery? The answers to these questions depend largely on the reasons why robots are used, and the goal of maximising profits will not necessarily lead to the same result as the goal of maximising the benefit to society as a whole. The feasibility of these goals themselves depends on the social and political climate, and the level of understanding of those in a position to control these issues.

There is something of a precedent in the industrial revolution, which affected western societies when steam power began to replace people's muscles. Much the same concerns were equally valid then; large numbers of people were put out of work, there were gigantic social problems, and society as a whole underwent profound change. But we've survived. The end result (grossly oversimplified) has been that one person can now do an amount of work which would have required many people without powered machinery; so people are more productive, and we all have more. A rather similar thing has happened on a more abstract level with computers; we no longer need great numbers of people to keep and transcribe records of various sorts.

Can the same thing happen again with robots?

WHAT SORTS OF JOB ARE THERE?

If robots do the jobs which people cannot, or will not, do, then there is little cause for concern. In fact, though, robots are more and more taking over jobs which people can do, and are doing. The reasons are largely economic: while a robot is fairly expensive to install, it is comparatively cheap to run, it is reliable, reproducible, teachable, tireless, uncomplaining, doesn't go on strike, needs no welfare services ... – indeed, it is the model employee.

*My grandfather said, out of those he could hire,
Not a servant so faithful he found;
For it wasted no time, and had but one desire –
At the end of each week, to be wound;
And it kept in its place, not a frown upon its face,
And its hands never hung by its side –
But it stopped.*

Short.

*Never to go again,
When the old man died.*

*Ninety years without slumbering,
Tick, tock, tick, tock ...*

— Henry Clay Work.

CAN WE ABOLISH WORK ENTIRELY ?

For generations, perhaps for most of the life of the human race, the need to work has been seen as a blight. In more recent times, "labour-saving devices" have been welcomed as a step towards the day when the social imperative to work would be a thing of the past. Such sentiments were harmless when there was no prospect of their ever being tested by reality – but the reality is now beginning to become thinkable, and robots are a part of it. With further developments, will we be able to do away with work altogether ?

Almost certainly not, for the foreseeable future – but the question is interesting as an extreme case. What would a society without work be like ? In past ages, a few people have been able to occupy themselves as they saw fit, by being rich and relying on the work of other people. The record is mixed. Some (I imagine, most) are not notable for anything; some do great things in art, science, public affairs, and other fields; others turn out to be unmitigated catastrophes.

But there is more to it than that. They lived in a society which was designed to cope with a few rich and powerful people doing whatever they wanted. The society had its own constraints, and the system survived for a long time. Our society is not well adapted to large numbers of people without much to do, and such social controls as still exist are weak.

So we are led to ask : do we *want* to abolish work ? I would like to believe that people who are relieved of the necessity of working would be happy to occupy themselves with constructive, enjoyable, and improving activities, but it is far from obvious that this is a realistic view. Some people may be able to manage it, but daily newspapers make it clear that not everyone does. Psychologists suggest that work is a necessary component to one's sense of self-worth.

Aldous Huxley, in *Brave New World*, imagined a society in which mechanisation had reduced the working day to an hour or so – but to make the system work, almost all the people had to be brainwashed from birth into accepting an existence of material luxury, but mindless futility. It was helped along by unlimited safe sex and a readily available drug. (There's a familiar ring to all this ...) In effect, the people were dehumanised to the status of robots – but they were happy. Is that enough ?

What do people think about it today ? Here's an interesting exchange of views (admittedly from last night, if not quite from yesterday) from *The New Zealand Herald*, 15 August 1984 :

The introduction of faceless electronic robots in the New Zealand freezing industry – with drastic reductions in the human workforce – is foreseen by the executive director of the Freezing Companies' Association, Mr Peter Blomfield.

Robots, he told a meat industry research conference in Hamilton yesterday, would perform many tasks that now required human labour.

They would significantly reduce labour. In a European chocolate plant, for example, pieces of chocolate were positioned by two robots at a rate of 270 pieces a minute each, replacing 23 women.

Some resistance to robots from the workforce was becoming apparent. More resistance could be expected.

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From *The New Zealand Herald*, 16 August 1984 :

A suggestion that electronic robots could be introduced into New Zealand freezing plants was described by freezing industry unions yesterday as a nightmare.

The secretary of the Auckland Freezing Workers' Union, Mr Trevor Kelly, said he considered the proposal to be an all-out attack on the jobs of freezing workers.

He had some strong words, too, for the man who made the suggestion, Mr Peter Blomfield, the executive director of the Freezing Companies Association.

"We will make a robot to replace him if he is so keen on them", Mr Kelly said. "We can do without an executive director and some of his cohorts."

But Mr Kelly said the prospect of having robots replacing men was seen as an absolute "no no" by the union.

"Sure, we realise that some jobs can be done by machinery, but when people start talking about

putting robots in, then that is going too far. It is a nightmare.

"Overseas, robots are building robots. We will get to a bottom line where people are not needed and then we can just forget about our future."

The national secretary of the Meat Workers' Union, Mr A.J. Kennedy, said there was no way his union would allow the use of robots.

"It just shows the mentality of some employers once they develop dollar signs in their eyes and the sort of dreams they have", he said.

"The suggestion is completely out of touch with the reality of what society needs. They should be looking at ways and means of placing people in jobs."

Mr Kennedy said he wondered who would pay taxes and who would be able to buy the goods they produced when robots had taken over jobs.

What would people think now ?

AND WHAT ABOUT THE ENVIRONMENT ?

The first industrial revolution worked by making it possible for each person to do many people's work, and the result was (potentially, if not in fact; the sort of society you have make a difference in obvious ways) more goods and a better standard of living for everyone.

But in the process, over the last two hundred or so years we have used up an enormous fraction of the world's easily winnable resources. If we have robots and universal work, will it be even more expensive in resources ? Conversely, if we insist on preserving resources, can we avoid robots putting people out of work ?

I have no good answers to these questions. I haven't noticed any good answers from anywhere else, either. I wish I had.

Alan Creak,
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