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Letters to the Editor

Dear Sir,

Skin Edge Detection

In the clothing, leather and pasteboard industries the materials consist of thin objects. Very often these are made available at work stations in a pile and must be separated for individual manipulation. In order to facilitate the grasping of the materials, destacking requires, in particular, the detection of the edge of the object. This delicate operation becomes all the more difficult in the case of manipulating natural products in their raw state, such as animal skins in a tannery. In this case it is impossible to use stereoscopic vision methods because they do not allow us a sufficiently fast processing time compatible with industrial requirements.

Because of the above considerations we propose to use a laser light source projecting a line on the skin stack and then to analyse this line with a video camera linked to a computer. The difference in levels between two successive skins creates a characteristic discontinuity in the laser stripe. The resulting video image is then processed by computer. The speed of the break line recognition depends on the laser beam power used. Our skin detection method is based on two procedures:

1. Location of the stripe by thresholding, then tracking, following and storing the centreline pixels of maximum intensity.
2. After rejecting breaks smaller than two pixels which do not correspond to an edge, we then search for the particular configuration which yields the skin edge position.

This treatment involves some expert knowledge (e.g. tannery, manufacture of smooth and flat objects, etc.) which increases the picture interpretation efficiency (Expert Systems).

The results obtained by detecting the skin edge in a tannery demonstrate the efficiency of the camera-laser device by using 3D vision. Without replacing it totally by stereovision, which involves two or more cameras, our device can in some cases be a good substitute not only because of the simplicity of the algorithm, but also because of its lower cost.

The solution recommended in this Letter will be integrated into a BRITE project sponsored by the CEEE. as part of the collaboration of our laboratory with the Centre Technique du Cuir of France.

T. Redarce, A. Jutard and J.-M. Birginie
INSA Lyon
20 Avenue Albert Einstein
69621 Villeurbanne Cedex (France)

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Are you peddling your Ferrari or: how about some lateral thinking

I had a very interesting business trip in late January 1994, the results of which might be of interest and benefit to readers of Robotica. However, as with all good stories I had better start at the beginning.

My wife (Dr Valerie Owen), is Managing Director of our own company, and is Manager of The Diagnostics Club, a DTI/LGC partially funded Club whose mission is Technology Transfer. Unfortunately, Val (who has a worldwide reputation in the biosensor field) has Multiple Sclerosis which means that she is less and less able to use a keyboard.

Over the past couple of years I've kept a watching eye on voice-to-text software systems as a possible option for Val. In mid-1993 I saw a voice-to-command system that worked okay, but at the time I was told that voice-to-text systems were very expensive and only available in the USA!!

In late 1993 we had a meeting with a Department of Health official during which voice-to-text systems were mentioned and we were informed they were available in the U.K.

Subsequently we visited The Computability Centre at Warwick (UK). The enterprise is dedicated to helping disabled people communicate through the use of computers and computer-driven aids.

During our five hours at Warwick we saw and used a variety of communication aids for disabled persons. Whilst speaking to Bill Fine of The Computability Centre the concept of **peddling your Ferrari** came about. Given that the keyboard is essentially a device from the 19th century, why are we still using it? It is a slow method of transferring information, it is the source of repetitive strain injury (RSI), it can be large and cumbersome and clutters up a desk. Consequently, usage of the fastest i486. computer (i.e. the Ferrari) is limited by a slow (pedal-power) mechanical input device whose origins are at least 100 years old.

By contrast, consider voice-to-text software. This allows a person to dictate editable grammar and commands (via a microphone) to the computer. Once attuned to the person's voice the input rate is about 50 words per minute, the user is not hunched over a keyboard, and RSI does not occur. Another benefit of voice-to-text systems is that sufferers of RSI are not discarded from the workplace, but are allowed to continue a worthwhile and satisfying career. Additionally, the cost to the employer of investing in voice-to-text software is a fraction of the cost of legal settlement of RSI and related cases that end up in court, not to mention the subsequent social security costs to the State.

The efficiency of this option, allowing the Ferrari (for example i486 computer) to be driven at full-speed, has been noted by many organizations. For example, solicitors use voice-to-text because their work uses a lot of common blocks of text with a few unique words. Thus the user is able to call up standard paragraphs with two-letter macros and customise the document to suit a given need – all of this is via voice commands and voice-to-text input.

So what has this to do with Robotics? Simply it is to suggest that you should not automatically use what is available or what has traditionally been used. Consider what is really needed and what is the best process by which that can be achieved.

Keyboards and keypads are used throughout industry, the reasons being that 'they are there', they are cheap, and 'anyone can use them'. Great, except that keyboard input takes time, can take a large number of keystrokes, and is subject to error and sabotage. In addition, there is the contradiction that

people are often considered a hindrance to the efficient operation of a manufacturing enterprise, yet people are needed to monitor, service and maintain automation.

So given that people are a necessary adjunct to automation why not, for instance, consider voice commands, light pen input, or touch screen icons.

Similarly, are you sure that your project is not influenced by what is the latest technological fashion irrespective of its relevance to your needs? Do you consider whether you are using too complex a solution to solve a simple problem. Are you blindly filling specifications and/or grant applications with current buzzword acronyms solely on the basis that it might impress the end-user or grant payer?

The power now available on relative low-cost work-top or lap-top computers is immense. Abuse or misuse of this tool is all to easy, being complacent over choosing the most cost-effective solution or option (where cost relates to more than just the primary purchase) for a given problem can have huge financial or social implications.

We now have the option of using the Ferrari. The choice to be made is whether to use them optimally or whether to take out a more sedate vehicle.

Tony Owen
SciTec Ltd
1, Otter Close
Bletchley
Milton Keynes MK3 7QP
(UK)

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