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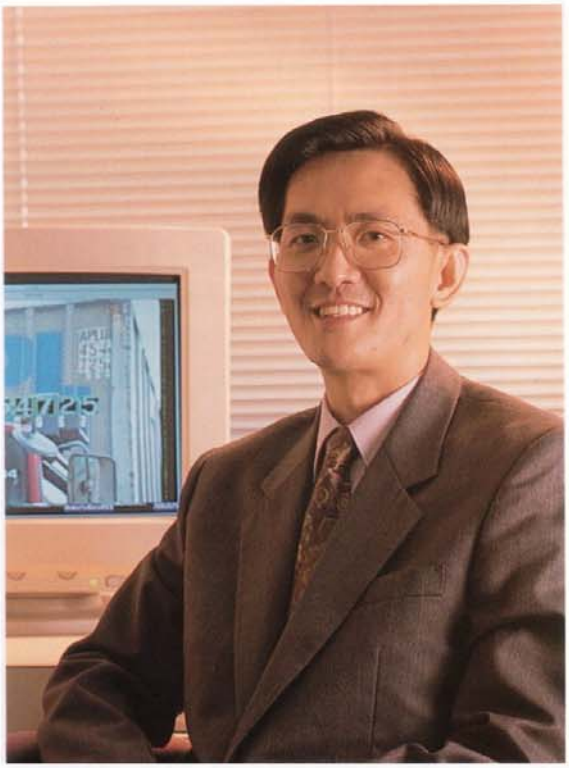
ADVANCED TECHNOLOGY

Presently, in Hong Kong, gatekeepers at terminals must manually enter the identification codes to verify and match the exit or entry of containers with delivery trucks for security. "This traditional process of human recognition and inputting of the information is time-consuming and has a higher percentage of error," said Dr. Lee. "To ensure security and increase efficiency at the terminals, VECON's main emphasis has to be accurately locating and recognising the printed characters on containers and license plates."

VECON'S generalised alpha numeric character recognition system adjusts accordingly for potential distortion variables, i.e. complex grey surface, peeling paint, faded colour, structural bars and uneven lighting. "It adapts to real-life situations found at terminal ports," said Dr. Lee. "With two separately trained neural network architectures, the second network complements the first to increase accuracy in recognition."

"In addition to accuracy, the average processing time to recognise an image size of 650 x 512 pixels varies from .59 seconds to just under four seconds, depending on the CPU platform," said Dr. Lee. "We are at application stage, and are in the process of installing a pilot system for several users at the gates to accelerate the processing time for import and export containers," said Dr. Lee.

"We addressed the market needs in developing VECON, and with the fast growing trade industry worldwide, the system is in great demand," said



"We are at application stage, and are discussing with several users on the installation of such a system at the gates to accelerate the processing time for import and export containers" said Dr. John Lee.

Dr. Lee, who has already had discussions with industry users and potential partners. Over the summer, he has also made visits to North America and China to introduce and discuss applications of this system.

In July, Dr. Lee received a special invitation to join a research project for license plate recognition by a prestigious institution, the Centre for Pattern Recognition and Machine Intelligence at Concordia University in Canada. "Although container recognition was the first project, the system can also be applied for other usages," said Dr. Lee. "It can be used to recognise license plates at parking structures to check unauthorised entry or exit of cars."

"At this stage, we are seeking legal protection on the intellectual properties before we finalise any deals," said Dr. Lee. "Having support and encouragement from the HKUST Technology Transfer Centre and Hong Kong Industrial Technology Centre in bringing this product to market has been valuable," said Dr. Lee.

Dr. John C.M. Lee, *Assistant Professor in the Department of Computer Science at the Hong Kong Universtiy of Science and Technology, has a B.Sc., M.Sc. and Ph.D. in Computer Science from the University of Minnesota, USA.*

科技先機

續第一頁

VECON 的一般化阿拉伯數字識別系統，可認得潛在的某些數字變形。即使數字髒在斑駁的灰色表面，油漆剝落，字褪了色，有橫杆擋住或光綫不勻，仍能辨別。「那是按貨櫃碼頭的實際情況設計的。」李博士解釋：「這個系統有兩套獨立設定的神經網絡結構，第二個網絡與第一個相輔相成，增加辨識的準確程度。」

「這個系統不但準，而且快。要識別一個有650X512 像素的圖像，所需平均時間視乎所用的中央微處理器平台而定，最少只爲零點五九秒，最多也不到四秒。」李博士續稱：「新系統目前已在應用階段。我們正準備在多個閘口試裝這個系統，以減少貨櫃進出口所需的時間。」

「我們悉力研製出 VECON，解決了市場上一項需求。由於全球貿易不斷激增，對這個系統的需求十分殷切。」李博士跟不少廠家和有潛質的合作伙伴洽談過，今年夏天還多次到北美和中國大陸介紹這個系統，講解其用處。

七月，李博士應聖馨國際的加拿大康科迪亞大學模式識別與機械智能中心邀請，參與一項辨別車牌的研究。據李博士透露：「該系統雖然最先用於貨櫃業，但其實用途廣泛，例如可用於停車場，檢查有無車輛擅進擅出。」

「在現階段，我們正尋求法律途徑以保護我們的知識產權。這個系統能在市場上佔一席位，實在多謝科技大學科技轉移中心和香港工業科技中心給予支持和鼓勵。」

李博士任職香港科技大學電腦系副教授，擁有美國明尼蘇達大學電腦學士、碩士及博士學位。

李春茂博士利用模式識別技術，使貨櫃碼頭的工作效率大大提高。

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行政總裁報告

行政總裁致意

香港一直被視爲亞洲區經濟增長最快的核心之一。憑着與世界各國的良好關係,加上鄰近地區所提供的低成本生產資源,令香港成爲發展高科技工業的天之驕地。

本人對香港政府的高瞻遠觸深表讚許,能夠把握如此天時地利,成立科技中心這機構,專責培育新生科技公司,並推動本港科技轉移及交流的發展。此舉不但令香港裨益良多,更有助提高亞洲區在高科技界的地位。

科技中心在促進本港科技工業的發展上,將扮演重要角色。事實上,我們已集中資源用以建立一個妥善完備的架構,供本港高科技工業孕育成長,尤其是科技中心的科技培育計劃及科技轉移計劃,已完成了初步試驗階段。此外,科技中心更計劃逐步提供產品設計及開發支援服務,以配合未來高科技工業的需要。

科技中心的員工積極進取,上下一心,除了希望再物色新的培育公司外,更計劃進一步改善我們的科技培育服務。目前除了科技中心內的五間培育公司外,我們希望能在今年年底前再招募兩至三間新成立公司加入,除了以低租金作爲招徠外,科技中心更將拓展其專業服務範圍,吸引具潛質的公司參與。

至於科技轉移計劃的目的,是要加强工業界與研究界的聯繫。我們希望藉此能把高科技供應商與用戶拉在一起,互惠互利。透過講座及科技展覽,科技中心希望能針對個別問題如知識產權等作出回應,提高業界對這些問題的關注,令科技轉移更見果效。

新科技中心大樓一直是我們工作的另一重點,將於年底落成啓用,屆時將標誌着科技中心發展的一個重要歷程。租戶亦將於本年九月陸續入伙。我們深信,假以時日,科技中心內的租戶將成爲一個高科技公司的集中地。

在這轉接期中,本人對科技中心至今所作出的進展深表讚揚。對前任行政總裁梁偉波博士的領導和奠基工作亦衷心感佩。面對新一階段的種種挑戰,本人與科技中心各員工將爲實現中心的宗旨和目標,共同努力。

劉助博士
行政總裁

科技先機

貨櫃碼頭吞吐量大增

「採用模式識別技術來提高貨櫃碼頭的吞吐量,正是將科技應用到商業上的一項典型例子。」香港科技大學電腦系副教授李春茂博士表示。「香港轉口貿易蓬勃,貨櫃碼頭的吞吐量需要不斷提高以應付龐大的增長。」

李博士發明了一個車牌與貨櫃號碼識別系統,簡稱 VECON。該系統結合了電腦視覺科技之長與神經網絡技術的强大威力,自動找出號碼,予以識別和核對。

目前,香港的貨櫃碼頭由守閘員人手輸入號碼,核實進出的車輛與貨櫃是否相符。「一貫的做法是以人手輸入和核對資料,不但費時,而且容易出錯。」李博士說:「爲了加强保安和提高效率,VECON 的設計重點是要能準確找出車牌和貨櫃號碼,予以識別。」

李博士表示:「新系統目前已在應用階段。我們正準備在多個閘口試裝這個系統,以減少貨櫃進出口所需的時間。」

續第五頁

Hong Kong Standard Oct10, 1994

IMAGE CONTROL: The new laser disc editing program developed in Hong Kong has both professional and recreational applications, and has the potential to become a new craze.

Re-edit laser movies at home

YOU are watching your favourite movie for the 20th time on laser disc.

Now you want to skip to the best scene in the movie. You search backward and forward but still you can't locate it on the disc.

Another scenario: you are watching the worst movie in the world. You think you can re-edit the whole thing to make it a better movie.

But guess what?

Equipment

You don't have the millions of dollars worth of studio equipment to do it.

However, your troubles are now over — or nearly, anyway.

Under the leadership of Professor John Lee, a group of students from the Hong Kong University of Science & Technology has been working on a computer program that can locate and classify scenes as well as re-edit movies directly from laser discs.

> "At present, editors have to search through the video to locate a particular scene with the backward and forward functions. With the new program, they can specify the scene or object they want and call it up."

The young scientists are graduate student Dickson Ip, PhD student Xiong Wei as well as Hui Kum-chun and Lee Yeuk-hoi.

Mr Hui and Mr Lee have since completed their undergraduate programs in computer science.

The program has a long title: Intelligent Video Manipulator — Image Classification and Indexing.

It was recently exhibited at the Fifth Asian Information Technology Expo '94 at the Hong Kong Convention & Exhibition Centre.

The program is designed to run on any Macintosh-based computer system.

It is similar to a word-processing program, except that it works with images instead of words.

The program can build an entire table of contents for a movie, based on the key frames of the movie.

A frame is a single image, or still, from a sequence of images which fit together to make one continuous camera shot.

Sequence

The program-user can index all the key frames from the existing table of contents. With the index in place, he can call up any particular image or sequence.

He can also completely re-arrange the sequences of frames.

Furthermore, he can manually select an object or a pattern.

The program will then track it in the different sequences and place the sequences in a group.

According to Prof Lee: "We are currently working on classifying schemes for identifying indoor or outdoor scenes, kung-fu scenes, car racing scenes as well as sports scenes. We are also developing an intelligent video database management system to facilitate flexible storage and efficient retrieval of video images."

Prof Lee also said that this program would be particularly valuable to video editors in news and other media organisations.

"It will be a time-saving device for them," Prof Lee said.

"At present, editors have to search through the video to locate a particular scene with the backward and forward functions. With the new program, they can specify the scene or object they want and call it up."

Grant

This is the second year Prof Lee has been working on this project. The project is based on a three-year grant.

Prof Lee welcomes any further inquiry. He can be reached at the Department of Computer Science, Hong Kong University of Science and Technology. Tel: 358 6972. Fax: 358 1477. E-mail: CMLEE@cs.ust.hk.

STORY: ALEX LO