CONTENT 目錄

慧眼之光　洞察秋毫

——访亚洲视觉科技有限公司（AVT）主席兼行政总裁李春茂博士

■　本刊记者　赵瑛

亚洲视觉科技有限公司（AVT）成立於1997年，是新一代视频光学字元识别（OCR）和模式识别技术的首要供应商。该技术主要应用于智慧交通系统（ITS）、物流系统、停车场管理系统、出入口控制、交通执法／交通监控系统、路桥收费系统（ETC）、港口作业和其他一些应用领域。2003年10月，在2003香港工业奖中，亚洲视觉科技有限公司荣获科技成就奖。2003年12月，在德勤公布的首届「亚太地区高科技高成长500强」中，亚洲视觉科技有限公司高踞排名榜第15位元，香港地区第2名。

记：亚洲视觉作为一家国际性的知名企业，其主打产品慧光牌自动识别系统广泛运用于世界各地的ITS行业，请您谈谈对全球ITS发展的看法。

李：我们现在主要做的有中国、东南亚、韩国、日本、澳大利亚、西班牙等国家的市场，由于产品先进，在各个国家和地区也广受好评。我觉得中国还是发展比较快，现在高速公路全世界排第二，在2008年之前还要快速的扩建，加上交通拥挤现在是全世界面临的难题，所以怎样通过有效的智能交通管理工具来帮助通畅是全球许多大城市的目标。

记：你们的产品在全世界各地都有应用，但是每个国家的交通法规和管理方式都不尽相同，您应用的产品是否"因国而异"呢？

李：应该说有相同的地方，也有不同的地方，比如说每个国家车牌的款式肯定有不同，还有每个地方的交通线路不同，交通规则也不尽相同。国外的巴士专线是不得进任何其他车辆的，即使外面的线很堵，也不能走进去，一旦进入巴士专线就被抄牌了。还有每个地方对产品的初始认识度也不同，澳洲警方在与我们接触以前，以为全世界最好的电子眼识别率就是百分之五六十，欧洲那边同样是和我们接触过才知道，原来有这么高的精度。我们一直承诺：要做就做最好，我们的识别率保证高于95％。其实我们自己必须要做到98％以上这个稳定识别率，才可能给自己设置95％这个门槛，这样客户在使用当中只会觉得比预计的更好，而不会更坏。

记：据我们所知，亚洲视觉最早2001年在深圳成立了子公司，然后在北京成立分公司，专门开发大陆市场。目前，贵公司在大陆的主要客户和合作伙伴有哪些？2004年有哪些新的发展计划？

李：与我们合作的主要以系统集成商居多，我们目前是靠他们的售后服务来为客户提供方便的，以免用户不放心使用，不同的区域有不同的系统集成商24小时不间断的服务。因为我们的产品特殊性，所

本刊记者赵瑛（右）与李春茂博士（左）合影

以许多项目都必须长时间跟进，北京有分公司负责北方的市场，深圳分公司负责南方的市场，香港市场有香港分公司，东南亚地区是由新加坡的分公司负责，澳大利亚也有在谈明年的合作计划。我们有好几个产品，现在在车牌识别这一块是我们主推的方向之一。因为我们所做的客户是全世界各地的，所以我们遇到的问题也相对的比别人多很多。应该说在全世界同行中，我们做的国家是最多的。安装的地点和安装的时间也是最多最长的。包括北京的长城饭店，和中旅大厦，这都是有些国家领导人经常经过的路线，如果遇上不是属于这一区的车，也不是的士，也很少在这一带出没的车就会被盯上，保安就会重点监控。像一些比较敏感的政治地区，都很需要车辆识别。还有一些边境和海关地区，也都非常欢迎我们的产品进来。我们共装了大约20个码头的场地，2002年底我们装了上海外高桥11条通道，2002年五月份我装了3个香港和深圳的边境(落马洲、文锦渡、沙头角)，总共有四万辆车进入(单日)，因为这个是全世界最繁忙的海关边境。这个案例成功以后，目前有很多海关来接触我们。它有很多好处，比如抓毒犯、走私之类。公安和警察根据车牌识别数据来杜绝不法行为，也防止海关官员自己的贪污。现在在台北的20多条车道已经做好了，像台北外交部、市政府地下停车场24条车道已经应用这个系统。日本的高速公路收费站，韩国的收费站的警察也有来了解我们的产品。我想明年的发展计划我们还是会以全世界各地的大型展会为主，然后再加上与更多更好的系统集成商合作，广泛的开发我们的中国地区业务和市场。2004年我们公司最大的举措可能是将在香港上市。

记：随着中国第一部《道路交通安全法》将于明年5月1日正式实施，交通管理力度必将加大，现在全国都要求交警要脱离执法，趋向于真正的交通管理，有效的节约警力。那么贵公司的产品是否能起到这个作用呢？它在世界上哪个国家应用得最好。您的产品性价比又如何？主要优势在哪里。

李：关于电子眼监控怎么帮助交警去执法，我可以打一个比方：在一个小时以内，我们依靠设备可以抓到百多两百辆的车子是没有交养路费的，闯红灯、超速驾驶，我们的移动电眼在一两秒钟以内已经可以知道这辆车子有过什么记录了，如果他有五次没有交罚单了，那么前面的路口即刻就可以给他扣押；但是如果光靠人眼去辨别和人力去执行是非常低效的。不止在中国大陆，世界上很多国家都有遇到同样的问题；还有偷车的问题，套牌的问题，也是比较关键的。现在我们的电眼在日本应用的比较好一点。目前行业内一个关键问题：同一样东西大家都嚷着去做，结果给用户造成眼花缭乱，用户没有办法辨别哪些是好的、哪些是不好的，无法衡量自己所需要的功能是不是能够兑现。有些在说明书上贴明识别率可以达到99%—100%，这实际上是不大可能的，这跟厂家实验时的数据有关。比如他测十辆车，都能识别这就是百分之百？！所以这需要一个科学为根据的准确数据，其中包括光照、残缺、阴影度、等等，现在国内很多大学都拥有电子眼的技术，所以他们要做这类型的东西确实不稀奇的。但是要形成一个产品不容易。我们在高交会上遇到好几个客户都有碰到这种情况，

办公室一角

他们买了产品以后，不到几个月的时间产品就出现问题，又查不出原因，甚至连原来的厂家也找不着了。可能客户觉得只要买的是电子眼就够了，完全预见不了可能产生的技术问题。所以最终他们大部分还是会找回我们来做。虽然在同行里面我们的产品是比较贵的，但是性能比来说，我们实际上并没有贵，因为我们的售出产品会有升级和自主的技术研发等。一个很关键的问题是要提醒客户朋友的：号牌识别并不是一次性投资的东西，必须要不断的改进，现在很多大的政府职能机构和集团公司都正在和我谈，想成立一个专门的研发机构来做车牌识别，我说没此必要，因为车牌识别只是大的智能交通系统里面的一小部分，而且要做许多的前期工作，比如调研、搜集实验数据、不断升级、加上车牌不断有新的种类出来，你要不停的更改许多参数。如果光是为了竞投一两个标来做，那这一家的费用和支出成本都太高了。由于我们公司是世界性的，分布在全世界的赢利点能够把我们的支出摊薄，况且已经投入了这么长时间。曾有一家公司告诉我，他们已经在进行类似的开发，而且得出的识别率是96.5%，但是他们只是从数千张照片里得出这个

数字，而我们是从20万张图片里得出的98%的识别率。识别率是有一整套测试方式的：它必须24小时不间断的测试数据，通过比较科学的方法，然后在最多车流量的点测试一个月，最后得出的结论才能有一定代表性。另外，产品的升级换代都是由我们公司来提供的，第一年是免费保用，之后每年按百分比来收费。我们产品的主要特点是利用视频抓拍进行识别，不需要地感线圈。我在美国读的博士学位就主修识别之一门，在香港任教的八年里也主要是教授识别专业知识，所以这种识别技术确是我们的强项。很多客户担心晚上光线暗会识别不了，其实我们不但夜晚照样抓拍得很好，即使车在高速公路上每小时跑100多公里的速度下，都能将状态很清晰的拍下来。

记：中国目前的汽车产业如此发达，建立大型的停车场势在必行，同时也产生许多衍生问题，慧光停车场车辆自动定位系统是为车主提供即时的自动寻车服务，目前有没有在中国大陆使用，情况如何？

李：我们这套停车场车辆自动定位系统能够自动记录所有在停车场中的车牌及其停放的车位号码。优点主要是能加强保安，为停车场保安提供增值服务，减少人为的错误，符合成本效益，准确性高，易于安装及操作。又由于它是一套自动实时的车牌号码和车位号码识别的便携式系统，所以操作非常方便，无须外在的触发系统。虽然我们现在暂时没有将这套系统推广到中国大陆使用，但已经引起很多客户的兴趣，而且我们预测这个产品的前景应该是非常好的：中国的汽车产业是国家支持项目，近年的汽车使用率又在不断的飞速提升，如果不采取有效的管理以及分层式的多相位停车方式，那么有车难停的问题还是会很明显。我们的系统正是很好的解决了停车场管理方以及车主两方面的难题，所以我深信它的发展前景。

记：贵公司除了在中国主打以上两种产品以外，还有哪些拳头产品呢？明年你们的销售方式还是以与系统集成商合作和代理为主吗？有没有什么具体的计划？贵公司作为世界知名的优秀企业对我们这本智能交通专业媒体有些什么期望或者要求。

李：目前我们开发的还有路段交通讯息系统，它可以采集车流量、测速，如果有什么危险品掉在马路上会造成交通事故的，我们都可以及时测到。因为我们不是通过地设线圈，而是通过不同车道的许多摄像将这些数据实时的记录下来。还有海港码头使用的岸边吊集装箱号码自动识别系统、集装箱自动定位系统、路段车速监察系统、还有与停车场系统同时使用的车型自动对比防盗系统等。这些都是我们非常优秀的产品，而且得到市场验证确实精确符合要求的。我们现在的销售模式还主要是以系统集成商为销售焦点，在逐渐了解国内客户对产品的要求以后，我们会通过展览、会议的接触，把产品介绍给他们，以助我们的集成商一臂之力。

要有第一手的市场情报，这还需要你们《中国智能交通》作为权威媒体，多给我们提供一些信息和帮助，我们非常感谢《中国智能交通》对我公司的采访。另外，你们明年上半年在云南昆明召开的电子警察专题研讨会和明年十二月在高交会馆举办的第八届智能交通产品展我们都非常有兴趣参加，也希望你们多办这些专业的展览和会议，预祝你们越办越精品！　中

附：李博士个人简介

智慧光科技（深圳）有限
AVT Technology (ShenZhe
亚洲视觉科技有限公司（AVT）主席兼行政总裁
李春茂博士

李春茂博士现为亚洲视觉科技有限公司的主席及总裁。他在1989年于美国明尼苏达大学取得计算机科学博士学位。在1992年出任香港科技大学助理教授之前，李博士曾在新加坡国立大学系统科学院担任研究员，期间并为新加坡港务局成功设计及安装世界上第一套集装箱号码自动识别系统。李博士所研发的「慧光」车牌及集装箱号码自动识别系统更取得两项国际专利，并成功把这项科研成果商品化。此外，「慧光」技术更为李博士赢得多项资讯科技及工业奖项。李博士在1996年出版的国际图像识别刊物之图像资料库中担任客座编辑，并从1998年至2002年担任国际多媒体工具及应用刊物编辑。李博士亦是许多国际会议的筹委会成员，并同时担任多家国际科技刊物及国际会议的评审员。

特稿

說，亞洲視覺科技公司首席技術總監黃永建（右）面對所有古怪車牌，其系統都可準確分辨出來。（譚德潤攝）

識別系統連PDA 古怪車牌難遁形

車牌規格注意事項

1. 車牌底色和字體顏色不可以太近似，如避免淺綠色底配白色字
2. 車牌的底色或字體兩者其中之一，必須是反光色調
3. 數字排列格式要嚴格規定，如上下行數，可否上長下短
4. 若容許圖案做背景，便不可太多橫紋和圓點
5. 車牌有外框可方便辨識工作
6. 要規定英文字和數字的字體款式，不可太花巧

資料來源：亞洲視覺科技公司

是「HE110」還是「HELL0」？是「CA510」還是「CASIO」？這樣的車牌，你可否過目不忘？

財政司司長唐英年建議推出「自訂車牌號碼計劃」，有前綫警員擔心計劃會令執法倍添困難。有車牌識別系統公司正研究把術技連接PDA，可幫助警員或管理公司輕易辨認車牌，加上嚴格規定車牌格式，就算底色是圖案的古怪數字車牌，也無所遁形。

8個字太長 運署需嚴定式樣

亞洲視覺科技公司主席及行政總裁李春茂表示，現有20個國家或地區採用其發明的車牌號碼自動識別系統，包括本港三個陸路口岸，落馬洲、沙頭角和文錦渡，準確率達99%。

這套系統最初是在貨櫃碼頭做貨櫃箱的辨認和尋找工作，貨櫃箱的號碼可以有十多個英文和數字，分橫排、直排、或分四行排列，比車牌的組合更複雜。現時系統的應用範圍已擴展至海關、警方、高速公路、隧道自動繳費系統等。

對於本港擬推行自訂車牌號碼計劃，該公司首席技術總監黃永建說，從外國的經驗，8個數字的自選車牌屬於偏長，因此運輸署要更嚴格規定車牌的樣式，方便用肉眼和機器辨別車牌。

他指出，車牌的字體款式不可太花巧，底色和字體顏色的對比一定要大，有外國容許淺綠色底配白字，紅底白字或黑字，橙底白字或黑色，透過電腦系統拍攝後，有時會變得模糊不清。

底色或字體 其一需反光

其次是一定要用反光牌，底色或字體兩者，其一都必須要反光，在光綫不足或夜間時，才可以清楚看到車牌號碼。他又認為，英文字和數目字的排列亦要釐定清楚。如分為上下兩排的車牌，是否需要上短下長。若是容許用圖案做底色，如美國內華達州可用風景畫，審批便要更嚴格，因為底色圖案多橫紋或圓點，車牌的英文字或數目字都可能會變成另一個字，易引起混亂。

現時這套車牌自動識別系統只需要連接手提電腦和數碼相機，便可放在車上四處使用，現在正研究放在PDA上，更加輕便和靈活。李春茂說，將來執法人員可以隨身攜帶，作為輔助工具辨別車牌號碼，解決執法困難問題。■本報記者 羅麗明

Interview
BUSINESS

●撰文、攝影（部分）：陳喜來　●編輯：陳若冰
●部分相片來源：經濟日報圖片庫　●美術：Eric

亞洲視覺科技將 OCR 結合神經網絡技術，應用在車牌識別、道路巡查、貨櫃智能管理、停車場管理、出入口控制等領域，將本土原創科技成功突圍而出，產品遍及全球。它的成功不單憑藉科技和創意，還有科學家最易忽略的嚴謹營銷策略和財務風險管理系統。

亞洲視覺科技專訪
談科技以外的生意經

產品面向世界

要找本土原創科技不難，但要找到一家能面向世界，迎戰不同實力的競爭對手，產品遍及世全球 20 個國家的本土科技企業，卻非易事。在 2003 年 12 月德勤首屆「亞太地區高科技高成長 500 強」中，亞洲視覺科技（Asia Vision Technology）排名 15，香港區排名第 2。創立公司的李春茂博士在接受 e-zone 專訪當日，就正要為內地幾條主要高速公路，安裝一套空中監察的車牌號碼自動識別系統。這套設施除可方便交通警員執法，亦能監察每條行車道的車輛流量。

▼李春茂不諱言，經營一間科技公司不單憑藉科技和創意，更重要的是嚴謹的營銷策略和財務風險管理系統。

「現時中港邊境已在 40 條車道安裝類似系統，未來還會陸續增加，以監察每日將近 4 萬架次的車輛。最近公司亦剛成功取得葵涌環球貨櫃碼頭的投標，而且很快便會安裝本公司的系統。未來我們將計劃發展在內地的碼頭，全中國大約有 200 個地點會購買我們的產品；此外，現時亦有 20 個國家採用本公司所研發的車牌自動識別系統，我們的目標是全球 100 多個國家。」李博士充滿自信地說。

現時不少先進國家已廣泛採用智能交通系統（Intelligent Transportation System）來應付各種交通運輸管制問題。他表示，公司未來主打，會是車牌號碼自動識別和貨櫃箱號碼識別兩類產品。在不久將來，慧光技術更可以植入手機、數碼相機、PDA 等類型數碼流動產品。

培訓銷售人才

他表示，該公司所研發的「慧光」專利技術，能保持領先的方法，就是知己知彼。他們經常參加國際性大型展覽會，就如本月底，該公司便會在西班牙舉行的國際性 ITS 展覽放設專櫃，售賣「慧光」產品。「香港在未來要轉為知識型經濟，需要時間培養和廣納人才。」現時李博士仍每日與公司負責 R&D 的博士和碩士員工開會，除一同構思產品研發外，亦不時檢討改進產品。

李博士表示，公司未來發展關鍵在於培訓出一批市場銷售人才。他形容就像踢足球「埋門一腳」要懂得入球，否則就會失去生意機會：「一個銷售人員要面對不同領域，像海關、碼頭、交通、收費站、物流、運輸、保安，需要不斷與應用項目經理的技術人員配合，解決問題，否則會蝕錢。現時市場熟悉『慧光』這類產品的銷售人才很少，需要內部慢慢培養。」

另一方面，經營一間科技公司，李春茂形容手上的專利產品就是「金蛋」。他表示，公司還有許多可申請專利的產品，只是無太多資金申請：「以慧光技術為例，整個申請專利的過程，就花去 10 萬美元；除申請費，每 3 年還要支付專利續權費，並答覆有關專利律師的查詢。」
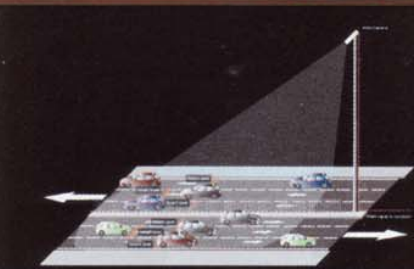
重視財政管理

對一間發展軟件的高科技公司來說，缺乏理財眼光，會不知不覺步入危機。李春茂不諱言，成本開支最大的項目，莫過於科研開發員工的薪酬：「公司的財政管理很小心，有時以為產品銷售情況理想，倘若資金不充裕，導致周轉不靈，分分鐘會出現很嚴重的問題。因此公司有專門負責計算每月收入的項目經理，分析銷售的成功率。這種營銷方法，並非 Science（科學），而是 Art（藝術）；要憑感覺，計算最壞的情況。當市場惡劣的時候，便要找短期產品來作周轉，盡量降低開支，直到長綫的生意接洽成功。公司現在將部分工種遷移到內地生產，而相對非太高機密的科研，就轉到深圳生產。」
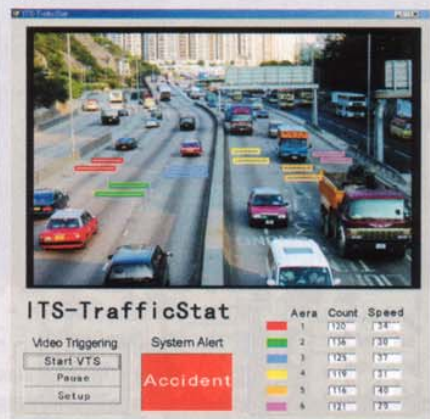
「我在大學時並無學過做生意，以前過於集中技術的層面。最初期，產品的開發成本較貴，經過幾年時間的磨練，學懂了財務分析和定價控制的重要性。現在要視乎市場的承受力，計算不同應用的市場潛力，要裝多少套才洽當，也要知道競爭對手會出價多少，各方面都要很有技巧控制。」

▲▼ 車牌號碼自動識別系統更可應用於停車場內。

甚麽是慧光視覺科技

亞洲視覺科技的鎮山之寶就是一套稱為「慧光」視覺科技的專利技術，93 年由李春茂博士與學生黃永健在科技大學研發，再一齊創立公司打天下。「慧光」是一套影像光學文字辨識系統，能讀取並識別靜止或移動中的汽車車牌號碼或集裝箱號碼。

物體的圖像會受到各種因素的干擾，如生銹、泥濘、油漆剝落、字體褪色、光綫的強弱等影響字元的清晰度，慧光技術字元號碼讀取方面，不論字元的大小、形狀、厚度和距離，均能讀取；字元識別方面，能將讀取到的字元自動縮放，使誤差降到最低。這項技術內含兩種獨立的神經網絡系統應用，並加以互相補充。系統可在《Windows》及《UNIX》平台上運作，處理及識別每幅圖像的平均時間更少於 0.5 秒。

▲▼ 亞洲視覺的空中監察的車牌號碼自動識別系統，除可方便交通警員執法，亦能監察每條行車道的車輛流量。

危機感提高警惕

亞洲視覺科技創立至今 7 年時間，他表示遇到的最大危機是在 2001 年，那時資金差不多耗盡，當時他們採取較透明方法，告知同事手上資金剩下多少，並且一齊面對。他認為，一間高科技公司最重要是理財策略及銷售技巧，否則理念有多好都無用，亦要有風險基金（VC）作為後盾：「假若無風險基金，公司便很難生存。在 2001 年初，公司面對財政問題，幸運地及時與渣打直接投資有限公司洽談成功，向公司投資第 2 筆風險基金，共 1,000 萬元，度過難關。」

「現時公司每年營業額約 2,000 萬元，長遠的目標是 1 億；今年淨利潤為 500 至 750 萬元，明年目標是 3,000 萬。」目前亞洲視覺科技的財政不單管理得宜，李春茂更揚言公司可望於年底上市。🄴

▲ 該公司的產品遍及世全球 20 個國家。

亞洲視覺科技發展史

年份	內容
1992-96 年	李春茂博士與黃永建在香港科技大學（HKUST）發明了慧光技術。
1996 年	慧光集裝箱號碼自動識別系統首次安裝於上海亞洲聯合集裝箱碼頭。
1997 年	李春茂博士及黃永建從香港科技大學取回慧光的知識產權，並成立了亞洲視覺科技有限公司。
1998 年	慧光車牌號碼自動識別系統首次被香港警方運用於中港邊界。地鐵有限公司(MTR)旗下的機場快綫，包括香港站、九龍站及青衣站均安裝了慧光車牌號碼自動識別系統。
2000 年	慧光技術獲得美國專利。第一筆風險基金注入（首富國際投資有限公司）作為股東。環球貨櫃碼頭（香港）配置慧光集裝箱號碼自動識別系統。
2001 年	獲得第二筆風險基金（渣打直接投資有限公司），現為主要股東，注入公司擴展業務。
2002 年	獲得香港特區政府海關過境車輛中港邊境監控專案，專案總體共 42 條監管通道。
2003 年	在香港工業獎中，榮獲科技成就獎。在德勤公布的首屆「亞太地區高科技高成長 500 強」中名列第 15 位及香港地區第 2 名。

Your Gateway to Global Business

Features

✉ Email This   👍 Rate This

April, 2004

Asia Vision Technology Limited: Bring the Digital Eyes to the Public Areas

The demand for a reliable Optical Character Recognition (OCR) system is on the rise as the transport infrastructure is getting more complicated than ever. The recent proposal of a Personalized Vehicle Registration Marks Scheme has advanced public awareness about the benefits bring along with the simulating human eyes. Hence, the idea for the Vehicle and Container Number Recognition (VECON) provides a comprehensive solution to those potential industries which desire a reduction in the incidence of errors and minimize the manpower required to track every movement. The VECON system, which was deployed by Asia Vision Technology Limited ("AVT"), has received widespread reputation in the global markets.

Award

AVT's outbreak technology of VECON has been awarded the "Hong Kong IT Achievement Award" for the VECON technology in 1998. Since then, AVT had demonstrated exceptional performance in developing VECON technology on top of other rivalries. In 1999, AVT received several awards and Certificates of Merits, namely "Hong Kong IT Excellence Awards"; " HKITCC Certificate of Merit in Technological Achievement" and " CMA Certificate of Merit in Machinery and Equipment Design" in the Hong Kong Awards for Industry. Moreover, AVT has outstanding performance in the international campaign, " Deloitte Touche Tohmatsu Asia Pacific Technology Fast 500" (DTTAPT). In 2002, AVT was awarded Number One position in Hong Kong (Number 48 in Asia Pacific) with revenue growth of approximately 840% over the last three years. In 2003, AVT was on the list again and was awarded Number 2 position in Hong Kong (Number 15 in Asia Pacific) in the same competition with revenue growth of approximately 378% over the last three years and again received "2003 Hong Kong Awards for Industry---Technological Achievement Award".

Envisage the Market trend

The flagship product, VECON, was a visual data capturing and reading technology, was invented by the founder at the Hong Kong University of Science and Technology (HKUST) in 1989. As the founder envisaged the growth potential market for the all-purpose computer eyes, he acquired the IP rights of VECON from HKUST and founded Asia Vision Technology Ltd. (AVT) to further develop and commercialize the VECON technology. In 2000, they were granted a U.S. patent for the VECON technology in order to protect its originality and establish its brand name. With the increasing complexity of transport infrastructure and logistics environment, AVT will experience exponential growth for a reliable transport management system. VECON solutions can be installed in existing in/out gate infrastructure, such as ports, container terminals, and vehicle checkpoints. It is foreseeable that the implementation of the Road Safety Law in Mainland China would increase the business demands for VECON solutions and services in the long run.

Highest Accuracy Rate of 98%

Critical factors related to product characteristics, financial decision, marketing, and pricing strategies are critical to the success of any forms of business, particularly for high technology products which require continued quality improvement to cater for the rapidly growing IT market. VECON has been proven to provide reliable results and outstanding accuracy rates of 98% at all times even under the toughest environment conditions. The accuracy of the system has provided AVT with comparative advantages to outplay other rivalries. In comparison, AVT has attempted 200,000 times of experiments to draw a conclusion of 98% success rate. The number is more representative than other industry players who claim that they can achieve 96.5% accuracy rate merely based on a few thousands of photo-takings.

Whenever they are entering into a new market, they will gather another 100,000 photos to increase the system reliability. AVT's commitment to the technology development has remained its leadership in the VECON technology.

Given the extensive experience of AVT in developing innovative computer vision solutions, the patented VECON technology can unquestionably improve the efficiency and effectiveness of the society as a whole.

Email this Article

| Friend's Name: | | Your Name: | |
| Friend's Email: | | Your Email: | |

Add a Personal Message:

Submit   Copy Yourself ☐

* From time to time, we may conduct direct marketing of TDC's products or services via e-mails or other forms of communication to your friends. Upon receiving such promotional material, your friends may choose to opt-out from our distribution list.

香港貿易發展局
Hong Kong Trade Development Council
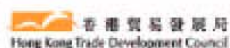
tdctrade.com | Web Directory | My Virtual Office | Business News | About TDC
Industry Verticals | TDC Global Network | Feedback | Help

專題故事

✉ 向朋友推介　👍 評分

2004年4月

亞洲視覺科技有限公司：全天候的電腦視覺系統

隨著交通網絡的急劇發展，國內以及國外的最新信息和系統都甚受各界人士關注。就以目前香港財政司所建議的「自訂車牌號碼計劃」為例，就再次帶起社會人士對識別系統的應用方向，並計劃將識別系統連接ＰＤＡ，提高執法者的效率。一間名為「亞洲視覺科技有限公司」（下文稱為「AVT」）是香港主要的識別系統研究商，並發展了「慧光」(VECON)電腦視覺系統，由於技術發展達到國際級水平，其傑出表現使AVT成為行內的佼佼者。

獎項

AVT在識別技術方面做出的突出貢獻，應用範圍遍及物流系統、停車場管理系統、出入口控制、交通執法/交通搖控系統(ETC)、港口作業和其他應用領域。在產品開發和標準建立等方面起著領導作用。1998年，慧光技術榮獲香港資訊科技成就大獎優異證書。1999年，榮獲香港資訊技術卓越大獎；以及由香港工業獎頒發的「廠商會機器及設備設計優異證書」和「香港工業科技中心公司科技成就優異證書」。2002年，在德勤公佈的首屆「亞太地區高科技高成長500強」中，亞洲視覺科技有限公司名列排名榜第48位，高踞香港地區第1名(過去的三年營業額增幅高達378%)。2003年再榮獲德勤「亞太地區高科技高成長500強」中，AVT名列排名榜第15位，高踞香港地區第2名(過去的三年營業額增幅高達840%)。直到2003年，AVT又再一次榮獲香港工業獎。

獨具「慧眼」，本港開發「慧光」識別技術，切合市場需要

從研究出生的VECON的創立人，毅然從香港科技大學跳出商界發展，為集團寫下決定性的一頁。這個技術在大學中取得成果之後，公司便以成本價取得這個科研專利權。先在最講求原創精神的美國申請專利，以增加客戶對AVT的本地創作有信心，有助建立公司的形象。AVT更掌握了市場需要，在研究和改良上也下了不少苦工。這項技術解決人類用肉眼識別的極限。對於現代交通網絡日趨繁忙的大都市來說，政府對交通管理無疑有急切需要。而VECON的誕生就為各地提供了良好的方案，可以有效地減低警力，主要受惠的地方是海關邊境、停車場、隧道收費站，範圍之廣可以遍及所有政治敏感性地區，以收防患未然之效。加上中國第一部<道路交通安全法>將於2005年5月1日正式實施，這有效提高市場對VECON的需求。

辨識率高達98%

其實除了財務決策、市場策略、價格定位等問題會對產品的銷售量造成影響之外，產品本身的質素亦是一個重要的關鍵。這對一間科技公司來說尤其重要，因為發展這一類別的科技產品需要更新系統、包括改良產品以配合市場需要，並不如銷售一件普通的消費品，而更需要加強售後服務。這個可以辨識車牌的辨識技術在本港、國內、台灣、新加坡及英國使用，並推廣至南韓、中國、美國及歐洲。AVT可以比其他生產商優勝是因為有充足的數據以支持AVT 的辨識率，可以達到98%以上的穩定識別率，而這一項保證是他們是從20萬張圖片所得出的結果，並配合一套完善的測驗方式；在二十四小時不間斷的測試資料，通過比較科學的方法，在最多車流量的點測試一個月。這樣得出來的結果具有代表性，而且有說服力。相反地，如果識別率有96.5%，但只是從數千張圖片得出這個數據的話，說服力必然大大減低。基於這個元素才可以使AVT在世界比賽中獲得肯定。由於不同地方的車牌的編制方式各異，為了保證AVT的技術的效能，每當他們進入一個新市場，他們會搜集數十萬個數據版以支持新系統的準確性。他們對科技改良的精神使產品質素上升，無論中文字、甚至乎牌面滿有泥濘也可保持著只有2%差誤的識別率。再配以真實的環境去試驗產品，可說同行之中，無人能及。

AVT的成功例子再次證明在香港要發展新科技是可為的。只要針對市場需要、加上獨到的眼光和創作精神，一個發明就可以使不少地區受惠，提升社會效益。

Total peace of mind

Tim Newbound looks at how OCR systems manufacturers are going about bringing total peace of mind to port operators with comprehensive solutions

O ptical Character Recognition (OCR) systems manufacturers are rightly pointing out that, where security-enhancing additions such as theirs' were previously a good option for busy ports, it is now much more the case that they are a requirement. But the sales pitch is far more tiered and comprehensive than the cut and dry 'need' and 'want' perspective. Choices presented to buyers in the market are becoming increasingly wide, as those responsible for developing new gate automation and container tracking technology break new barriers. The catalyst behind these efforts to further increase the capabilities of OCR technology has been a strong rise in orders, particularly over the last year, spurred on in itself by the imminent deadline for ISPS compliance. Left reliant on its own powers of persuasion, the technology, which is still in its relative infancy, may have taken some time longer to convince many investors to part with the required funds. But with the intervention of the Code, and the focus it brings on security, OCR is now being seen as a natural progression. "ISPS helped to

open the OCR market more quickly. It made container terminals think about the security at their gates, and made more budget available more quickly," says Anton Bernaerd, Business Development Manager, Camco Technologies NV, Belgium. The ISPS Code has not emerged without good reason, though, and May Lai, Administration and Marketing Officer, Asia Vision Technology Limited (AVT), Hong Kong, suggests that the hands of operators are being forced as much by necessity as regulations. Where the economic benefits originally had to be weighed up, it now seems the scales are firmly tipped on the side of pro-OCR. "A series of unfortunate events that have taken place in this millennium evolves [original] considerations. In addition to ROI [return on investment] and tracking of containers and vehicles for better productivity and efficiency, security is becoming an important factor to consider. The investment that was deemed as an option in the past has now become an imperative," she says. Now that security is accepted as a very real concern, then, where corners should not be cut, OCR technology is becoming all the more comprehensive. Evidence of this heightened importance within the maritime sector is not only defined by rising orders over the past 12 months. Far more emblematic of the market's mounting status are the levels of competition.

Manufacturers are no longer looking to provide systems that enhance security: they are aiming to build complete security solutions. Symbiotically, Bernaerd emphasises the need for the market to move away from rose-tinted statistics, and suggests that OCR is now capable of playing a vital role in providing genuinely tight-net protection. "The current OCR systems can only provide a part of the solution... It only delivers a solution for the automatic identification of containers at the gates, but you need as well a solution for the identification of the truck drivers," he says, alluding to his company's specialised total integrated solutions of OCR camera systems for the containers, combined with trucker ID console systems based on recent technologies like biometric identification and RFID Tags. Such systems are the ideal for every terminal, in a situation where the Big Brother-style invasion is justifiable. It is this idea of completeness that Bernaerd explains the industry must, now it is achievable, strive for. "We want to warn against the usage of statistics in this market of OCR-systems," he says. "The most important parameter that is used to express the performance of OCR systems is its recognition rate expressed in a percentage. Many vendors do produce statistics that are based on selected 'human or computer readable' images, thus creating a picture of what the system can only perform in theoretical

ideal situations, not in daily life." Bernaerd's problem with this system, he says, is that Camco's in-house statistics show 24 per cent of container numbers on one container side have at least one computer-unreadable letter. This, he adds, is a generous estimate when one considers the long distances, sun, smog, rain and environmental disturbances most containers go through. According to this statistical analysis, the same 24 per cent is also the most likely to be susceptible to human faults. The solution to this, Camco and their competitors argue, is more comprehensive systems. But back to the grey area of statistics, Berneard believes now is the time to stop promoting mediocrity. "One may wonder how vendors are promoting 99 per cent OCR rates and more? The magic trick comes from the shipping list. The results are checked or 'corrected' against a list of containers that should be unloaded from the ship (shipping manifest)," he says. "With such 'corrections', one can boost a 90 per cent if necessary to an impressive 100 per cent, of course the accuracy in that case drops significantly as does practical use. How much it drops depends on the length of the shipping list and how creatively the matching is done. Even more dramatic is the opposite way, loading the ship. In this case, the list should be based on the containers on the yard and not the loading list." Camco boasts to operate a far

Automatic reading of decals are 'translated' by computers

truer testing system, to avoid false expectations in favour of a more open, practical and exact approach; taking all containers that pass through its system during a minimal period of 24 hours, and calculating statistics on all of them without any initial selection – for example, night, day, clean, dirty, not readable by human eye. More cameras is, at the gate system at least, a notable facet of improving security in a statistically accurate fashion. But implementing a truly comprehensive solution involves more cameras at every container handling point, not just one area. As Amnon Katchalski, Product and Sales Manager, Hi-Tech Solutions, Israel, says of his company's products: "Hi-Tech Solutions has completed commercialising OCR-based solutions to all entry and exit ways to marine port terminal[s] via land or sea, thus increasing both port security and facilitating a

fully automated container handling scheme throughout the port." Certainly true of his company's range, Katchalski's description fairly well sums up the direction of all the manufacturers *World Port Development* spoke to. AVT lists the areas in which it can supply OCR systems as including: automatic solutions at the gate; on RTGs, RMGs, and quay cranes; container damage inspection (CDI) solutions; and mobile inventory vehicle (MIV) OCR solutions. This approach of unerring tracking is also mirrored by Camco, with Bernaerd saying: "Now that our OCR-technology has reached maturity, we continue with the development of OCR-systems for trains and cranes, thus creating a complete terminal visual container identification and tracking system." Hi-Tech's Katchalski concurs, affirming the ideal that regularly and strategically placed OCR installations can create a hopefully impregnable system of security checks and balances. "These entry and exit means to the port cover both land-access via trucks and rail and sea access via vessels entering and leaving the harbour," he says of his firm's SeeCrane and SeaGate models. On this scale, there lies potential for networked global tracking, and a market that may well seem limitless for years to come. And with such a potential market as bait, it is of little surprise that manufacturers are scrambling to reach the highest points of innovation. Reaching these heights appears to essentially involve removing all reasonable doubt over the accuracy of any reading. In gate systems such as Camco's 'Super Gate' and AVT's Vecon-Con, new generation OCR equipment has come of age (see related technology update article). Positioned all around a port, these often almost self-sufficient OCR systems bring surveillance to a new level. Mounted upon cranes, patrolling vehicles, or at the gates, OCR is now affirmed as a genuinely effective method for not just monitoring the movement of cargo, but redirecting manpower for the safe and smooth operation of the port even further. So while the goalposts may have been shifted regarding the how's and why's of OCR, the considerations of an investing port are remarkably similar, despite the heightened focus placed on security in recent years. It's still a matter of ROI, but the said return is no longer just economical. The technology is now fulfilling its protective potential, and, ISPS encouragement or no, the according peace of mind is surely justification enough for ports worldwide to implement the beginnings of a global network of danger-deterring surveillance.
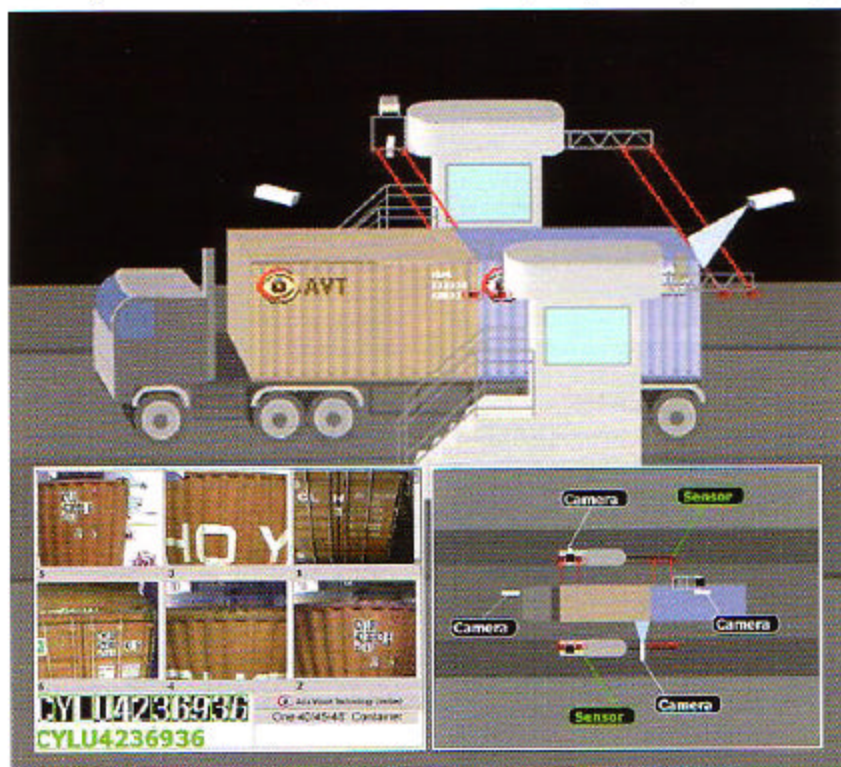
Axis Vision designed this computer-generated graphic of the ideal OCR system in action

P.100

Orders, creations and results

On pages 26 and 27, *World Port Development* details the market trends propelling OCR systems sales. Recurrently, one buzzword arises that truly sums-up the main selling point for companies: comprehensive. So thorough and intriguing are the latest OCR systems, in fact, that providing the specifications of individual technology types demands its own page space. So here, divided by company, is a list of the latest OCR options.

Asia Vision Technology

AVT's Vecon-Con gate solution is designed to quickly detect the presence and position of container(s), and detect trucks with varying container lengths by detecting the top edges of containers as they enter the sensors zone. As the truck enters the sensors zone, the video cameras located at the top, sides, and rear within the zone are precisely aligned to capture the numbers on the sides, top and rear of the container. Dual sensors are used to increase the system reliability, and control the threshold, with an adjustable timing, to guard against false triggers caused by wind and other environmental elements. Configurations of 1x20-foot, 2x20-foot, 1x40-foot, 1x45-foot, and 1x48-foot are all easily compatible with Vecon-Con. Four sensors are used to detect the container(s) position, while four CCTV cameras take about one to three images of the container(s). At the basic or lowest level, Vecon technology is used to process these images, and the result is that the numbers are recognised. At the next level and based on the results recognised, the algorithm in the Vecon-Con engine will determine and send out the best probable results. The result is then displayed to the operator through a user-friendly Graphical User Interface (GUI) at the client's terminal management system. Installable on existing infrastructure, AVT has worked to ensure that it can win contracts at a minimum cost to the customer, and that the technology can integrate seamlessly with

various Container Terminal Management Systems. The Vecon solution is intended to be very cost effective and affordable, to be installed even in the smallest container terminals. It is also flexible in providing an easy upgrade path when TEU volume or throughput grows and expansion plans materialise. Complementing this, AVT's Vecon-CDI system is usually installed at the In/Out gate or gantry of the terminal. Using high-resolution scan cameras to capture the container from the horizontal sides and the front, the image of the rear container is captured using a high-resolution CCTV camera. Capturing entire container surfaces, rather than just sections, these images are stored in the systems for easy retrieval, with zoom in/out and scroll left/right features. Affording complete visual damage inspection, AVT lists among the advantages of the system: the minimisation of manual labour in outdoor environments, limiting the possibility of industrial accidents; and helping to settle container damage disputes by providing visual data of the alleged container. With such feature-rich systems providing this level of overall protection, regular installations across a terminal can form a very tight net. The Vecon-Crane solution is used for recognising containers in motion, whether being transported on rail-mounted gantry cranes, rubber-tyred gantry cranes, or ship-to-shore quay cranes. These solutions, AVT claims, are ideal for verifying container ID numbers and ISO codes against the client's database, to ensure that containers are being loaded and unloaded correctly to and from vehicles and vessels. Providing additional tracking, this also allows further automation of terminal operations, and increased efficiency at the terminal berth; safeguarding against incorrectly loaded/unloaded containers. AVT lists other immediate benefits as: facilitating real-time global tracking and tracing of containers, and enhancing container inspection and inbound container pick-up, thus enhancing terminal performance consistency. A good case study of AVT's across-terminal solutions is AVT's

Mobile Inventory Vehicle Solution, Vecon-MIV, which operates at APM-Maersk Sealand Pier 400 Terminal LA, USA. The equipment or set-up is placed in a 4 x 4 truck, or similar vehicle, that traverses in the terminal for the purpose of maintaining container terminal inventories. At the Long Beach Terminal, the rows of container spaces or lots are clearly marked and stored into their Terminal Operation System (TOS). When the truck travels along the isle of these rows, the container information (Container Number, ISO numbers, and container lot location) are transferred back wirelessly and updated in their host system or TOS. Wireless technology like RF LAN is used at the container depot and the bandwidth used is low, as four images are captured and transferred to the host at about 50k to 100k each. Depending on the positioning of cameras, in accordance to whether it is double or single stacked containers, all the images can be captured and container numbers recognized by the Vecon MIV. Besides using Vecon technology for Container Number Recognition, the system also uses range detectors, GPS & antennae to detect, locate, and transfer information at the terminal. The equipment comprises of a high-resolution video camera and flask lighting system to achieve higher accuracy in reading the container number in adverse conditions. In operation, the zoom and focus of the video camera is adjusted automatically by the AVT system with respect to the distance detected by the range detector. The Vecon server is located at the rear of the vehicle, and is of industrial grade – designed to be shock proof and weatherproof. Users of AVT's Vecon systems include: CY Gate of CSX World Terminals (previously named as Sea-Land Orient Terminals), Kwai Chung; Beijing Export Processing Area; Beijing Changpin Logistic Test Site; Shanghai Wai Gao Qiao; Tianjin Export Processing Area; Tianjin Gang Chu Company; Tianjin Zhen Hua; Xiamen Export Processing Area; Dalian Container Terminals Co Ltd; and Shenzhen Export Processing Area, among others.

According to Cenco Technologies, OCR systems are now capable of playing a vital in providing genuinely tight-net protection

Automatic Vehicle Recognition System

Ir H.C Fan and Joseph C.Y Ho, Electrical & Mechanical Services Department

Electrical and Mechanical Services Department (EMSD) was entrusted by Customs and Excise Department (C&ED) to provide project management services on the supply, installation and commissioning of an Automatic Vehicle Recognition System (AVRS) for three land boundary control points, namely, Lok Ma Chau, Man Kam To and Sha Tou Kok, with a total of 42 vehicle passages. The HK$15 million contract was awarded in April 2002.

The AVRS for C&ED is the first large scale vehicle license plate number recognition system installed in Hong Kong with the following unique features: -

i)   Very high recognition accuracy (greater than 98 %)
ii) Real time colour video image display
iii) High system availability incorporating fault-tolerance measures
iv) Data Integrity and Security
v)   Real Time Monitoring

Artificial intelligence and fussy logic technologies are used and they are the heart of the video capture, character recognition of the AVRS system. The system provides real time capture and recognition of license plate numbers on both moving and stationary vehicles. Computer vision application will process images that may be deteriorated under various situations. For instance, rust, mud, peeling paint, or fading colours may distort the character's image. Uneven lighting and detached or bad reflective layer of a license plate would also make it difficult to discern. Nevertheless, this AVRS has been developed and fine-tuned to overcome these problems.

For each Boundary Control Point, it consists of three main components, which are License Plate Recognition Workstation (LNRWS), On-Site Monitoring Workstation (OSMWS) and Central Database Server (CDBS).

One LNRWS is installed at each kiosk, which is embedded with the recognition engine to provide accurate License Plate Number (LPN) recognition. The main feature of LNRWS is to recognize the license plate number from all approaching vehicles. The recognized LPN will then be passed to the existing Customs' computer terminal directly to improve the efficiency and accuracy of customs clearance. Furthermore, each transaction generates a vehicle record that includes captured images and the current system status of LNRWS. All the information are sent to CDBS for record keeping and future data mining.

On-site Monitoring Workstations (OSMWS) installed at various locations at each control point to provide system monitoring features. These OSMWS monitor the system status of every AVRS components such as LNRWS, OSMWS, CDBS by monitoring the heart beat messages generated by all system equipment periodically to ensure the system availability. Data mining and report generation can also be effected at the OSMWS.

The CDBS is a centralized storage for vehicle records, vehicle images, alarm message, evasion message and system status. It updates the system status from various AVRS system components including LNRWS, OSMWS, CDBS. It permits authorized users to generate different type of reports through OSMWS.


AVRS Terminal Display

In theory, a powerful personal computer equipped with one single camera could capture and interpret the license plate information. However, the license plate may be installed anywhere at the front part of a vehicle. Many factors could reduce accuracy leading to poor result. The problem has been tackled by using multiple cameras installed at various locations of the vehicle passage. Each LNRWS is equipped with four video cameras, one colour and three infrared, for image/video capture and recognition. Special Artificial Intelligence (AI) logic is employed to enhance both the recognition speed and accuracy.

System security and record integrity are two major elements for the AVRS and all captured images and data retrieved have been encrypted and truncated to prevent unauthorized use of the AVRS information. All images are encrypted with special "Watermark" and any alteration of the image file will render the disappearance of the special "Watermark" and hence be detected under routine / special audit processes.

To cope with the future development of C&ED clearance procedure, an Interface Control Document has been defined allowing the AVRS to interface with other systems that may be developed in future.

The AVRS has been in operation since January 2003. Manual procedures of recognizing and inputting of license plate numbers become automated with higher clearance productivity and enhanced security features. While the system has been employed with the primary objective of customs clearance, it is expected the same system with its associated performance and capabilities can also be utilized on intelligent transport system functions, e.g. toll collection systems, vehicle counting, etc. ❖
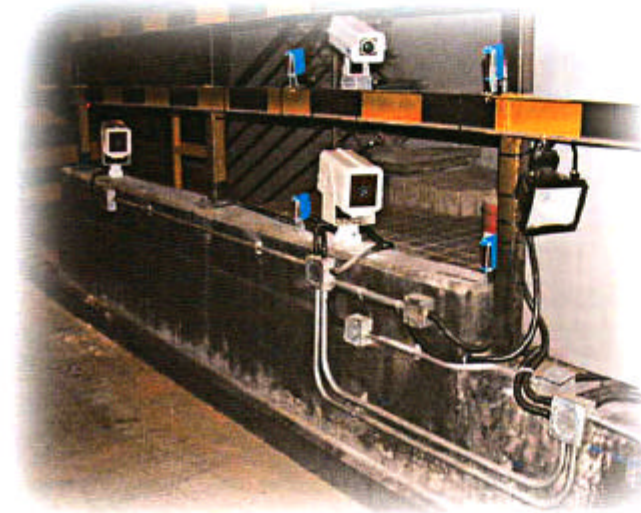
Typical AVRS Equipment Setup

Asia Vision Technology Limited

www.asiavision.com.hk

Asia Vision
Technology Ltd.

Executive Summary

Founded in 1997, Asia Vision Technology Limited (AVT) is the first and only Hong Kong-based company that develops and provides video optical character recognition and pattern recognition technologies. Currently, the company has around 50 staff in Hong Kong and three branch offices in Shenzhen, Beijing and Singapore.

AVT has the best-of-breed products and technologies for the markets it serves and some of them are the first in the world. Automatic License Plate Recognition Products (ALPR) are aimed at providing accurate and reliable means of capturing license plate information on statutory or moving vehicles; Vehicle Feature Matching Products (VFM) help car park operators to prevent car theft through switching license plates; Traffic Data Capture Products (TDC) provide useful ways of capturing traffic flow data and pattern. Automatic Container Number Recognition Products (ACNR) are AVT's flagship products designed to assist terminal operators, customs, shipping companies etc. to effectively identify containers for different application purposes.

Key competitive edges of AVT's products are: high accuracy rate, fast recognition speed, using off-the-shelf hardware and global implementation. AVT was the only company among other competitors from all over the world that could meet the accuracy requirement when bidding for the tender from the Customs and Excise Department, HKSARG in 2002. Eventually, it won the tender from HKSAR Government.

AVT has received many awards for its product excellence and innovation over the past several years. In addition, the company has a large number of clients from about 20 countries.

In future, the company will continue to innovate and develop new products. Moreover, it is going to further expand the distribution network in order to enlarge its market in overseas countries and mainland China.

"**O**ur company was the only company among other competitors from all over the world that could meet the accuracy requirement of 97.5% when bidding the tender from the Customs and Excise Department," said Dr. John Lee, Chairman and CEO of Asia Vision Technology Limited.

14

Company Background

Established in 1997 by two academic researchers from the Hong Kong University of Science and Technology, Asia Vision Technology Limited (AVT) is the first and only Hong Kong-based company that develops and provides video optical character recognition and pattern recognition technologies in the fields of security, parking, ITS (Intelligent Traffic Systems), logistics, traffic law enforcement/monitoring, electronic toll collection, port operations and other applications.

"The name [Asia Vision] reflects our mission to develop the latest computer vision software applications and system technology to create All-Purpose Computer Eyes from Asia," said Dr. John Lee, Chairman and CEO of AVT. "Our products are intended to simulate the capabilities of human eyes to improve security, business efficiency and life quality."

The company is now employing around 50 staff in Hong Kong and has three branch offices in Shenzhen, Beijing and Singapore.

Key Products & Services

AVT's products are grouped into the following categories:

1. **Automatic License Plate Recognition Products** - This product group covers applications related to the automatic recognition of vehicle license plate number.

2. **Vehicle Feature Matching Products** - This product group covers applications related to vehicle pattern and feature matching utilizing innovative computer aided feature comparison and pattern recognition techniques.

3. **Traffic Data Capture Products** - This product group covers the application of traffic data capture that forms an integral component of any traffic control management systems.

4. **Automatic Container Number Recognition Products** - This product group covers applications related to port, terminal, and intermodal operations.

"Our company is the result of more than 15 years dedication to R&D in computer vision technologies. It is innovative and is the pioneer in the industry," said Lee.

In fact, there is no other Hong Kong-based company that provides similar products. More importantly, some of AVT's products such as Mobile License Plate Recognition, Mobile Container Number Recognition and Vehicle Feature Matching Products are the first inventions in the world.

15

Competitive Edges & Excellence

"We are proud of our high product quality," said Lee. He explained that high accuracy rate and fast recognition speed are important to recognize letters and numbers on moving vehicles and cargo containers. The accuracy rate of AVT products is as high as 98-99% (the 1-2% distortion is largely due to damaged/dirty characters) and recognition speed is less than 0.2 second.

In 2002, AVT won a large project from the Customs and Excise Department, HKSARG.

"Our company was the only company among other competitors from all over the world that could meet the accuracy requirement of 97.5% when bidding the tender from the Customs and Excise Department," he expressed.

In addition, the company's solutions have proven to be cost effective with high accuracy, thus minimizing human errors and the number of manpower required and providing a higher level of security.

"Despite a backdrop of uncertainty and slow global economic growth, our company awarded 48th position (No. 1 in Hong Kong) in the Deloitte Technology Fast 500 Program in 2002 and 15th position (No. 2 in Hong Kong) in 2003," Lee said.

AVT has received various awards since its incorporation, including:

Awards:

Year	Award
2003	Hong Kong Awards for Industry - Technological Achievement Award
	Deloitte Touche Tohmatsu Asia Pacific Technology Fast 500
2002	Deloitte Touche Tohmatsu Asia Pacific Technology Fast 500
1999	Hong Kong IT Excellence Awards - Innovation Silver Award
	Hong Kong Awards for Industry: HKITCC Certificate of Merit in Technological Achievement
	Hong Kong Awards for Industry: CMA Certificate of Merit in Machinery and Equipment Design
1998	Hong Kong IT Achievement Award

16

Track Records

In 2002, AVT stood out prominently among strong competitors from all over the world to win a large project from the Customs and Excise Department, HKSARG. The project included the supply, installation and commissioning of an automated vehicle recognition system for Hong Kong's three different border control points, namely Lok Ma Chau, Man Kam To and Sha Tau Kok. The system covers a total of 42 lanes over three checkpoints.

In addition, MTR Corporation has also installed AVT's VECON-VIS (a license plate recognition system) at three Airport Express stations, namely Hong Kong, Kowloon and Tsing Yi. The system is used in managing the Airport Express shuttle buses and hotel/tour vehicles that are traversing the designated areas in the stations.

Furthermore, the company has recently been awarded a tender from Asia Container Terminal Ltd. in 2004. The project consists of 11 lanes of container number recognition system.

"AVT's clients cover about 20 countries. This is a great achievement for a Hong Kong-based company in such as short period of time," Lee said. Table 1 lists some of the company's major clients.

Table 1. Major clients

Hong Kong	Mainland China/Overseas
• Customs & Excise Department, HKSARG • Civil Engineering Department, HKSARG • Drainage Services Department, HKSARG • Airport Authority • CSX World Terminal Ltd. • Asia Container Terminal Ltd. • Chubb Hong Kong Ltd. • Wilson Parking HK Ltd. • Edward Keller Ltd • MTR Corporation Ltd. • Kowloon Motor Bus Co. (1933) Ltd.	• Amano Corporation in Japan • AURORA Group in Taiwan • CET Technology in Singapore • Her Majesty's Government Communications Centre in UK • Maersk Pacific (APM Terminals) in US • Roads & Traffic Authority in Australia • Berge Group in Spain • Scheidt & Bachmann in Germany • Shanghai Waigaoqiao Free Trade Zone in mainland China • Japan Police

Critical Success Factors

AVT's critical success factors evolve three elements: people, technology and commitment.

Since AVT is people-oriented, it believes in the people (customers, partners, shareholders and employees) whom it is in touch with. It also believes that their potential creativity and capability are significantly contributing to the company's success.

17

AVT is technologically driven and is always at the forefront of video imaging and optical characters recognition technology. This enables the company to innovate and develop solutions that are adaptable to different environment and conditions of every country.

AVT is also a committed company. The company strongly believes that the foundation of trust and commitment is essential to provide responsible products that can improve life and provide a safer place for everyone.

These three elements bring out the best in AVT. In essence, these three elements are also the supporting pillars of AVT.

Future Plans

To meet the ever-demanding requirement from its customers, AVT will continue to innovate and develop new products based on video imaging and optical characters recognition system for the betterment of mankind. These developments may also include solutions that are based on proprietary or patented technology that can be deployed over open systems.

To tap the markets in overseas and mainland China, AVT plans to expand the networks with its partners and distributors. "We cannot rely on ourselves alone to expand our market reach. We have to leverage on our partners' resources and expertise," Lee concluded.

Biography

Dr. John Lee,
Chairman and CEO of Asia Vision Technology Limited

Dr. Lee earned his Ph.D. degree in Computer Science (specializing in computer vision) from the University of Minnesota in 1989.

He was a researcher at the Institute of Systems Science, National University of Singapore from 1989 to 1992 where he designed the Container Number Recognition System for the Port of Singapore Authority. From 1992 to 2000, he was a professor at the Hong Kong University of Science and Technology. Dr. Lee was a member of the Editorial Board for the Journal of Multimedia Tools and Applications and a guest editor for the 1996 special issue on Image Database for the Pattern Recognition Journal. He was elevated as a Senior Member of the Institute of Electrical and Electronics Engineers in 1999. He invented the "Method and Apparatus for Verifying a Container Code" and the "Method for Identifying a Sequence of Alphanumeric Characters", which were patented in UK and US respectively. He also served on several program committees of various international conferences and he acted as a reviewer for numerous journals and international conference.

Mr. Ken Wong,
Chief Technology Officer of Asia Vision Technology
Limited

Mr. Wong obtained his Master of Philosophy in Computer Science from the Hong Kong University of Science and Technology. He is one of the early developers of the VECON technology.

Being the Chief Technology Officer and co-founder of Asia Vision Technology Ltd., Mr. Ken Wong leading the Research and Technical Development of the company to develop the numbers of new VECON recognition module for more than twenty countries worldwide.

In 2002, he leaded the technical team to successfully complete the implementation of the "Automatic Vehicle Recognition System Project" (AVRS) for the Customs and Excise Department, HKSARG which required License Plate Number Recognition System for 42-lane at HK-China Border. We were the only company, which can achieve the tender requirement of 97.5% accurate rate. He was also the key Person for the AVRS's System architectural design, implementing and quality assurance.

For the VECON-CON - Container Number Recognition development, Mr. Wong successfully designs & develops the World first Mobile Container Number Recognition System (VECON-MIV) for Pier 400, US in 2002. This has widened the product line of VECON-CON and created new market for the company. In 2004, his contribution to enhance the VECON-CON technology has once again be the major factor for AVT to be awarded the order by Asia Container Terminal Ltd., HK.

19

hc360 慧聰網安防行業頻道專訪 28 Dec，2004

客戶成功就是我們的成功—專訪亞洲視覺李春茂

亞洲視覺科技有限公司（AVT）主席兼行政總裁 李春茂博士

　　他是一位學者，更是一位企業家，在新加坡國立大學系統科學院擔任研究員期間，爲新加坡港務局設計並安裝了世界上第一套集裝箱號碼自動識別系統，從而取得國際專利。1992-2000 年他在香港科技大學任教期間所研發的"慧光"車牌及集裝箱號碼自動識別系統取得美國專利，而後他成功把這項科研成果商品化。現在，慧光技術研發的產品遍及全球 20 多個國家，在同類產品中市場佔有率達到前 3 名。他曾作爲許多國際會議的籌委會成員，同時擔任多家國際科技刊物及國際會議的評審員。

　　2003 年由他與黃永建先生領導的"亞洲視覺科技有限公司"在德勤公佈的第 2 屆"亞太地區高科技高成長 500 強"中，以過去 3 年營業額增幅高達 840%的佳績高踞排名榜第 15 位。

　　他就是亞洲視覺科技有限公司（AVT）主席兼行政總裁李春茂博士。時值李春茂博士來華考察期間，本網對李博士進行了專訪。在整個採訪過程中，從言談舉止之間筆者深深感受到的是李春茂博士睿智的儒商本色。

從夢想到實現 慧眼識別的突破

亞洲視覺科技有限公司（AVT）成立於 1997 年，作為新一代視頻光學字元識別（OCR）和模式識別技術的專業供應商，一直致力於將最新電腦視覺技術應用到經濟生活中。主要應用於智慧交通系統（ITS）、物流系統、停車場管理系統、出入口控制、保安及監管管理、閘口收費管理、城市路口閘口監控管理、海關通關監控管理、重點單位車隊管理、交通執法/交通監控系統、路橋收費系統（ETC）、港口作業和其他一些應用領域，並且取得了令業界矚目業績。

當談到亞洲視覺的標誌 "全能電腦眼" 時，李博士笑稱 "全能" 是一種理想，是眾人所期望努力的一個方向。他介紹說視覺系統的發展源起於 30 年前，當時實用少，產品技術發展局限性很大，但近 10 年以來硬體不斷創新，過去不能實現的現在都可以通過科技手段達到。隨著 ITS（智慧交通系統）在中國的廣泛應用，國內外智慧交通系統的最新資訊和系統知識普遍受到業界的肯定，"全能電腦眼" 在 ITS 上的應用備受矚目，亞洲視覺正是充滿信心地在電腦視覺這一領域內充當領導者的角色，並立志以 "全能電腦眼" 來提高商業效率。

強化產品優勢 奠定領先地位

現在國內市場的智慧交通科技發展已接近國際水平，識別類產品的科技含量逐步提高，李博士認為亞洲視覺的識別產品在智慧交通領域擁有兩大優勢，一是有效的提高了夜間抓拍的準確性，二是滿足了高速公路等特殊環境對識別抓拍在速度上的要求，除此之外 "慧光識別系統" 對於亞洲特殊文字元號的超強識別能力也是一大特色，李博士強調亞洲視覺所擁有的領先優勢全都是因為在不同應用環境中經驗的累積。

對於高科技公司來說，產品本身的質量以及進入不同國家時的本土化進程可以說是奠定領先地位的重要考量標準。李博士對這個看法尤為贊同，他表示亞洲視覺擁有充足的資料以支援 AVT 達到98%以上的穩定識別率，這是因為 AVT 的產品要配合一套科學完善的測驗方式在車流量最多的地方24 小時不間斷測試一個月，最後從數十萬張圖片所得出結果。由於不同地方的車牌的編制方式各異，為了保證 AVT 的技術的效能，每當他們進入一個新市場，他們會搜集數十萬個資料版以支援新系統的準確性。他們對科技改良的精神使產品質量上升，無論中文字或日、韓文字、甚至乎牌面滿有泥濘也可保持著只有 2%差誤的識別率。

目前亞洲視覺的收入來源主要集中在兩大部分，其中公司收入八成來自車牌號碼識別系統的銷售，其次為箱號識別。李博士表示亞洲視覺因箱號碼自動識別系統起家，經過多年的研究發展系統已經十分完善，所以全球範圍內的競爭對手很少。不過由於全球貿易不斷激增，對數位識別產品的需求十分迫切，眾多廠商意識到這一領域巨大的經濟前景陸續加入其中，市場競爭趨向激烈化。基於此李博士將企業發展方向定位在謀求合作夥伴放眼全球市場上面。亞洲視覺跟不少廠家和有潛質的合作夥伴洽談過，通過技術轉讓以及合作發展，為進駐當地市場打下堅實有力的基礎。

謀求合作夥伴 放眼全球市場

李博士介紹說因為 AVT 所擁有的客戶遍及全球，遇到的問題也相對的比別人多很多，所以 AVT 主要採用合作的方式進入當地市場。AVT 的合作夥伴包括中國在內，遍及全球 20 多個國家主要以當地的系統集成商居多，一方面靠他們的售後服務來為客戶提供方便，以免用戶不放心使用，不同的區域有不同的系統集成商 24 小時不間斷的服務一方面他們比較瞭解當地的市場和環境有利於產品的推廣。因為 AVT 的產品特殊性，所以許多專案都必須長時間跟進，李博士表示亞洲視覺北京有分公司負責北方的市場，深圳分公司負責南方的市場，東南亞地區是由新加坡的分公司負責，香港及其它國際市場有香港母公司負責，未來 3－6 個月計畫在上海建立分公司。亞洲視覺著力集中資源，為培養新生的科技公司提供開發支援服務，配合未來高科技發展變化的需求，把高科技供應商與用戶結合在一起達到互惠互利。

除了尋求合作夥伴以外，李博士認為參加展會及論壇也是推廣高科技產品最好的宣傳，一方面促進與用戶之間的溝通與交流瞭解市場需求打開市場行情，一方面展示科技產品，把公司推出去引起業界關注提升市場的知名度。比如 2001 年三個季度裏亞洲視覺就參加了全球的 25 個展會，其中中國 8 個。

按照一般人的理論，能夠運作如此複雜的全球市場推廣活動，幕後肯定擁有著一隻極為龐大的團隊，但是 AVT 的規模並不大。從 5 個人的小公司起步，直到成為覆蓋範圍極廣的企業，李博士認為主要一點就是依賴高科技人才在員工中所占的比例，科研需要的就是貴精不貴多的頂尖人才。

構建一流實力團隊　激情創造產業奇跡

對於一隻由博士、碩士以及眾多優秀人才組成的團隊來講，技術優勢之外更需要的是鍥而不捨的奮鬥精神。而這也是 AVT 不斷地從順境中取得成功的要素，李博士坦誠亞洲視覺在發展過程中交了很多學費。AVT 的成功證明瞭只要針對市場需要、加上獨到的眼光和創業精神，一個發明就可以使不少地區受惠，提升社會效益。亞洲視覺一直以豐富的實際安裝經驗和不懈的研究發展努力來保持我們在業界內之領導地位。他們的目標是透過向系統集成商、商業合作者和軟體發展公司進行技術特許，將"慧光"（VECON）技術推廣至全世界。

背景介紹：

1995 年創始人李春茂博士和黃永建先生在香港科技大學成功完成了慧光技術核心部分的研發，並在 2000 年成功地獲得美國專利註冊。在 1996 年， 第一套慧光集裝箱號碼自動識別系統安裝在上海 United Asia Container Depot。1999 年成功為所有香港地鐵機場快線安裝車牌識別系統．在 2000 年， 慧光集裝箱自動識別系統成功安裝在香港的 CSX 環球貨櫃碼頭。2002 年，在香港海關邊境安裝 42 條通道。

移动式电子警察
在智能交通管理中的应用

☑ 木声炀　亚洲视觉科技有限公司

1、现阶段我国交通管理现状

随着中国经济的快速增长，道路交通需求旺盛。1990 年至 2003 年中国机动车辆平均增长率达到 15.21%，交通流量也以平均 15% 左右速度递增。目前我国私人汽车已突破 1000 万辆，各类汽车拥有量为 2000 多万辆。由于车流量的迅猛增长，依赖民警传统的路面执法来解决车辆违章问题需要耗费大量的警力，收集、处理、存储、传输、识别车牌的信息已是原来的手工管理模式无法实现的。交通矛盾十分突出，使城市土地资源容量和城市环境容量都受到了极大的挑战。

如何应对经济繁荣带来的交通问题，是交通管理者面对的需要解决的十分迫切的问题。电子警察一词逐渐得到采纳和公众认可。电子警察系统是为了制止交通违章而出台的方案，为整治车辆违章、协助进行交通控制提供全天候、严格且可行的解决交通矛盾。

电子警察是交通执法系统的组成部分，该系统所形成强大的威慑力，促使广大驾驶员不敢随意违章，从而既保障了交通安全。因此，建立有效的电子警察系统在交通秩序管理方面占有举足轻重的地位，是交通管理现代化的重要标志之一。目前，无论在发达国家，还是在发展中国家，为了解决城市交通管理问题，都在建设自己的电子警察系统。实现车牌信息的自动采集录入、违章查询、统计、打印等功能，实现电子自动执法的功能。电子自动执法功能的实现和组建专门的执法队伍，标志着电子警察系统成为单独的一套交通执法管理系统。智能交通涵盖了交通管理方方面面，其中最基础、最关键的就是要建立道路交通实时动态车牌识别信息系统。美、欧、日等发达国家在实施智能交通系统（ITS）过程中，始终把车牌自动识别实时动态信息系统的建设放在十分重要的位置。

2、亚洲视觉的电子警察产品

据统计，上海市电子警察在 2002 年 2 月到 2003 年 4 月的 14 个月间共抓获有效的机动车辆违章 336581 起。安装电子警察的路口或路段，机动车辆违章率普遍下降 60~80%。北京、广州、深圳、重庆和成都，也都安装了电子警察系统。随着电子技术、通信技术、计算机技术等高新技术的发展，为交通管理提供了解决交通问题的新思路和新手段，对提高交通的机动性、安全性、有序化，最大限度地发挥现有道路系统的交通效率提供了技术支持。目前，亚洲视觉公司的电子警察产品至今已成功安装在全球超过 20 多个国家和地区，并针对我国的需求以及我国交通流的特性，也自主开发了视觉 SER（SUPER ROBO-EYE）电子警察相关产品。系统对道路交通堵塞、驾驶车辆行经道路旅行时间、交通事故、道路施工、车速及路线限制、停车诱导等交通实时信息，通过车牌识别将上述收集的信息编辑、处理成为可编辑的数据库能够传输、比对、判断并给交通警察部门作为管理工具。

实践表明，采用视觉 SER 电子

警察系统是解决交通拥堵、减少交通事故、防止交通污染、及时控制各种不合安全车辆上路提高交通管理水平的最有效的方法和手段。总之，电子警察的应用对于协助交通管理、降低交通违章率有不小的作用。

因此，在交通管理部门实施电子警察系统是一项十分迫切和重要的工作。

3、亚洲视觉简介

亚洲视觉科技有限公司于1997年在香港成立，并设有新加坡、北京及深圳分公司的高科技企业，拥有国际领先的字符(OCR)和图像识别高新技术。自成立以来，公司已在停车场管理、集装箱码头和智能交通控制等领域上取得良好业绩。公司的慧光技术(VECON Technology)在2000年获得美国专利（专利号为：6026177）。2003年，亚洲视觉科技荣获香港工业奖中的科技成就奖，并在德勤公布的首届—亚太地区高科技高成长500强—中，高踞排名榜第15位，公司过去三年营业额增幅高达840%的佳绩。

4、亚洲视觉的电子警察系统设计理念、工作原理及应用实例说明

亚洲视觉电子警察系统设计理念是由若干便携式移动电子警察系统SRE作为工作站，SRE中央管理系统平台而组成完备的电子警察执法体系。前端电子警察系统SRE对通过视频触发方式进行车牌识别，同时传输识别结果到SRE中央管理系统平台，统一进行黑名单管理，识别结果比对，发送报警资料到前端SRE，报表检索功能。从而实现电子警察在交通管理中的区域更广泛，时间具选择性，自动化程度更高。

4.1、系统优点

·电子警察系统SRE可于个人计算机、工业计算机或笔记本计算机上运行，没有地理位置的限制；

·SRE可支持模拟视频信号(Analog Video Signal)和数码视频信号(Digital Video)输入；

·SRE中央管理系统使用固定的公网IP地址，各个工作站多种联网方式和中央管理系统通讯，包括局域网，广域网(专线，PDA，ADSL，GPRS或CDMA/1X网络)等。

·可安装于天桥、支架、车内或路边，可用于固定地点也可用于移动车辆中工作；

·以视频触发方式抓拍车辆图像，以避免路面安装及地感铺设，并实时显示图像；

·用户界面同时显示实时影像和已识别车辆之影像及结果；

·识别结果存入档案数据库并可汇出至文字文件；

·实时搜寻过往记录，包括时间，车牌号码，及更改识别结果

·可选的声音、视觉报警，声音可以配置；

·车牌黑名单及白名单资料之汇入、汇出及查核功能；

·电子警察系统中心可以实时监控各个工作站情况，及时获得各个工作站数据，并对非法车辆做出及时处理；

·统一管理名单资料、统一管理各个工作站结果数据；

·可以与客户管理系统集成；

·工作站与数据中心可以通过互连网、局域网及GPRS网络进行通信。
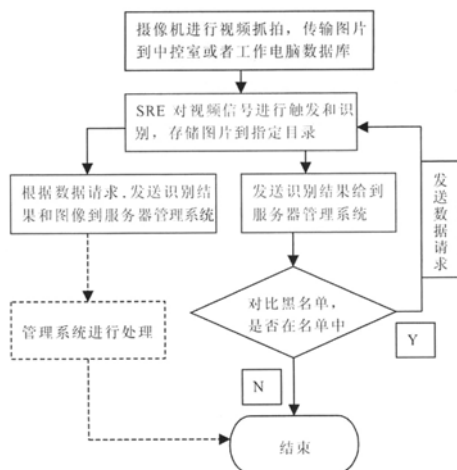
4.2、系统架构
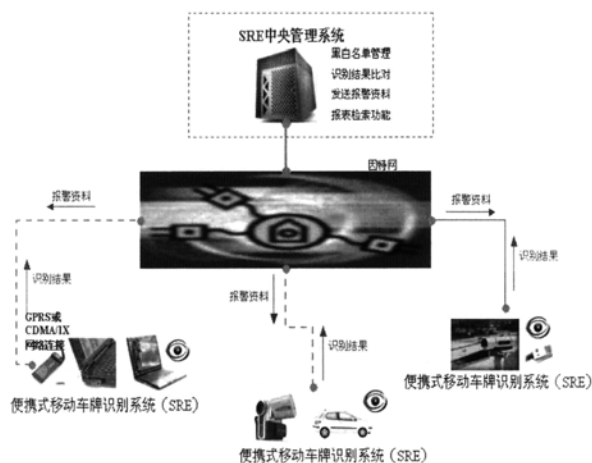
4.3、工作流程

在电子警察系统中，其核心模块为车牌识别模块，由视频捕捉设备进行视频触发，抓拍车牌传送到计算机，电子警察车牌自动识别系统采用视频触发方式在画面中寻找车牌，由计算机通过核心技术通过图像切割、识别、存储等处理对车牌进行识别，同时在指定的系统目录下存储图像。通过TCP/IP通信协议定义的信息，传输识别结果到服务器的管理系统和黑名单数据库进行比对，如果该车牌信息在黑名单数据库

P. 113

中，管理系统发送数据请求给电子警察车牌自动识别系统。

电子警察车牌自动识别系统，接到管理系统数据请求，通过TCP/IP通信协议提供车牌信息（时间，车道号，车牌号）和对应的图像给管理系统。

4.4 作原理流程图解：车牌特写图片抓拍 --- 图片预处理 --- 车牌定位 ----- 字符切割 --- 识别单元

车牌特写图片抓拍　　　　　图片预处理

车牌定位　　　　　字符切割

车牌识别单元
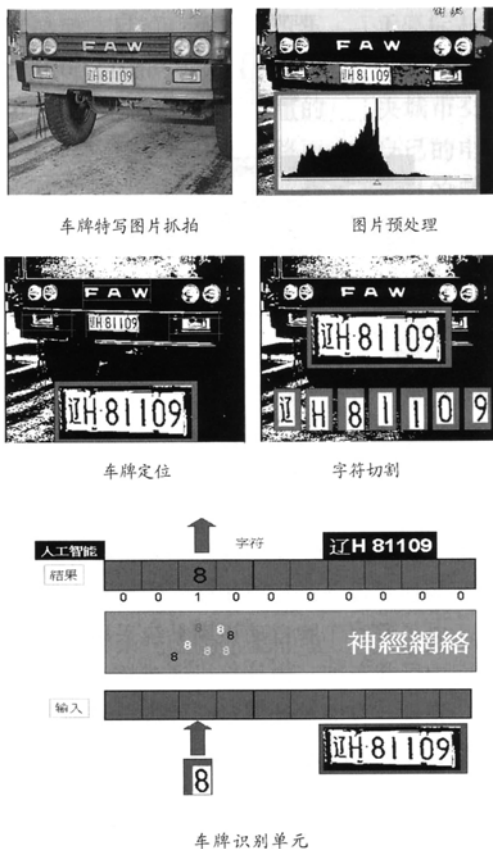
识别技术结合了图形类比和神经网络的优点、可以随着样本的增加不断学习和提高识别率。电子警察系统使用前要做初始化工作，各便携电子警察系统和中央管理系统都提供设置接口；

中央管理系统可以维护一个庞大的名单资料，各个便携电子警察系统车辆信息传递给中央管理系统后，中央管理系统马上判断车辆是否合法，并马上将不合法车辆的报警信息发送给对应警察岗位，在岗警察可以通过接受到的报警信息进行处理交通情况。

5、电子警察系统应用功能简介

5.1 软件界面

图 1 系统主界面

本界面可以分为5个区，分别为左边的[控制功能区]，[当前地点选择区]，[实时影像区]，[交通流量统计区]和右边的[结果区]。

5.2 前地点选择区

电子警察系统是一个流动性的应用系统，在一个城市中可以有多个系统在不同的地区同时作业。选择当前的地区可以令系统上传至总部的识别和报警信息能够区分区域。该区域应显示当前的作业地点。

图 2 地点选择窗口

5.3 时影像区

该区域显示了实时影像。只要系统联上了摄像机并开启，实时影像就会出现。

5.4 通流量统计区

交通流量根据时间和作业地点来统计，一旦车辆进入摄像机的视线，系统接收到识别结果信息，交通流量会自动累加。一旦用户更改了地点，交通流量的统计开始时间会变更为当时的时间，并把车流量设为0，重新开始统计。

5.5 结果区

一旦车辆进入摄影机的视线，系统就会把抓拍的图片显示在识别结果区，把识别结果信息加到识别区的识别结果表格，并把车牌号码显示在识别结果区中(第二行)。结果表格能保存100条识别结果，超过100条会把最早识别的那条记录从表格中先移除(数据库记录不会被删除)。如果在比对中发现识别结果为有疑问的车辆，那么根据用户设定，系统会给出报警，弹出报警窗口，提示报警声，报警字样会呈红色并于界面中闪烁。
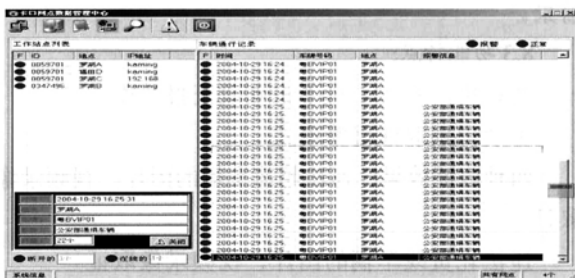
- 有新的识别结果时，自动更新抓拍图像和识别结果。
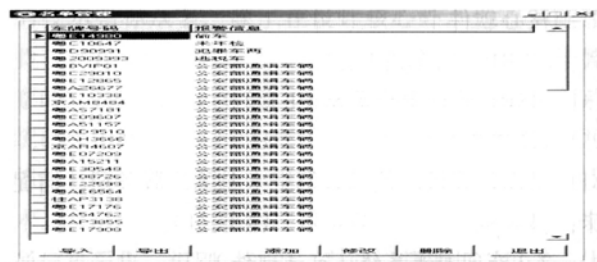- 锁定现在所显示的识别结果，不进行自动刷新。

5.6 报警界面

6、系统功能 –SRE 管理中心系统

6.1 SRE 管理中心系统界面

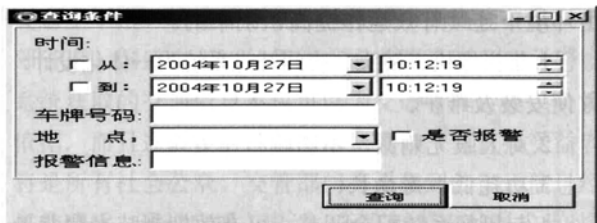系统实时动态显示各个工作站的车辆通行信息，并实时比对和报警；

系统可以显示各个工作站点的联机状态。

6.2 各工作站点设定
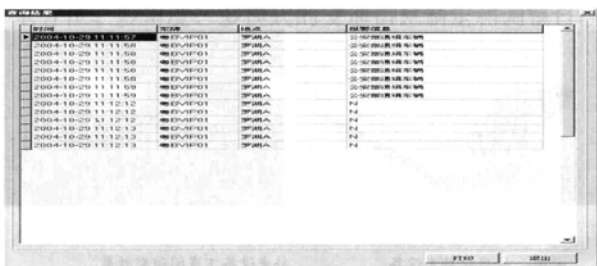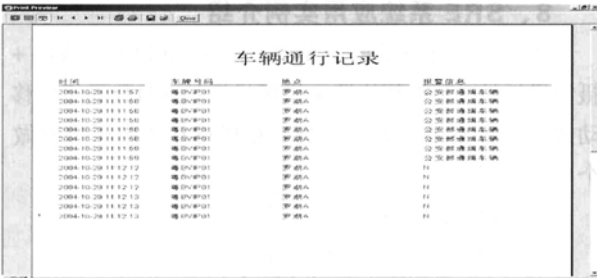

6.3 名单管理

6.4 查询条件

6.5 查询结果

6.6 报表

车辆通行记录

P. 115

7、系统需求

7.1 软件需求

SRE 运行环境

- MS-Windows 2000 专业版 或 MS-Windows XP
- 来自微软的最新操作系统补丁
- DirectX 8.1 或以上
- 要求安装 TCP/IP 协议

SRE 管理中心系统运行环境

- MS-Windows 2000 专业版 或 MS-Windows XP
- 来自微软的最新操作系统补丁
- 要求安装 TCP/IP 协议

核心软件

- SRE（每车道 1 套）
- SRE 管理中心系统（1 套）

7.2 硬件需求

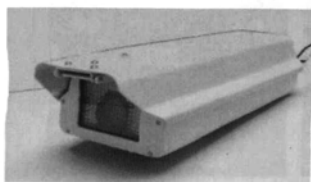工作计算机，便携式笔记本电脑，服务器，捕捉卡，摄像机，镜头，防护罩，LED 灯光

7.3 夜间补光系统（可选部件）

优秀的夜间补光系统是支持系统在夜间及光线不足环境下连续有效运作提高识别率的。

1. 集摄像机、镜头、夜间补光系统为一体化设计：方便安装及维护；

2. 对人眼无刺激，不影响行车安全；

3. 功耗低、寿命长；

4. 与摄像系统配合调节，可有效抑制眩光和背景光；

一体化补光设备　　补光设备下夜间识别效果

8、SRE 系统应用实例介绍

亚洲视觉开发的电子警察产品包括(1)地感线圈＋摄像机抓拍,(2)视频检测＋摄像机抓拍,(3)数码相机移动式电子警察等，如下就数码相机移动式电子警察做个应用介绍。

8.1 系统组成：

- 处理单元—笔记本电脑
- 前端摄像单元—数码摄像机
- 前端测速单元—火花雷达
- 车载逆变电源
- 路缘移动智能执法系统
- 车载承载附件
- 设备保护箱

- 同步光源 LED 灯(选配)
- 车载打印机(选配)
- 移动执法 PDA 终端(选配)
- 非现场处理软件网络版(选配)
- 酒精测试接口(可拓展)
- 超载限重接口(可拓展)

8.2 系统概述：

可以自动抓拍动态和静态的车辆，识别多国和国内的蓝牌、黄牌、黑牌和白牌等号牌，发现违法车辆（违法闯红灯、未年检车辆、报废车辆、被偷车辆、肇事通缉车辆等车辆）自动语音报警，同时还可以对路面上的各种交通违法行为（违法超速、违法压黄线、违法掉头、违法停车等行为）给予打击；采用自动与手动两种取证模式，实现违法车辆图片和视频两种取证效果；具有前台抓拍和后台数据处理的功能，实现现场处罚与非现场处罚相结合；建立三级网络架构，具有网络执法能力，在公安与交通领域有广阔的应用前景。

8.3 功能特点：

两种执法模式：自动识别取证报警模式

手动识别取证报警模式

四种取证效果：违法超速车辆的图片、视频录像取证

违法轧黄线车辆的图片、视频录像取证

P. 116

违法掉头车辆的图片、视频录像取证

违法停车车辆的图片、视频录像取证

六大系统功能：号牌识别语音报警功能

前台抓拍和后台数据处理的功能视频雷达联动触发比对功能

车流量的检测自动分析功能手动任意抓拍违法行为功能

移动中心与执法终端同步等功能

八种打击手段：打击未年检车辆

打击报废车辆

打击闯红灯车辆

打击肇事、逃逸和通缉车辆打击违法超速行为打击违法轧黄线行为

打击违法掉头行为

打击违法停车行为

8.4 数码相机移动式方案特点：

· 交警随身携带，是交警的一种新的值勤手段，避免现场处罚、拖车等带来的影响交通问题；

· 可以由交警人工控制抓拍违章行为；

· 可以临时固定在一个地点，通过视频检测抓拍某一区域的乱 停乱放、逆行、压黄线等违章行为；

· 加入车牌自动识别软件，可用于查堵盗抢、逃逸、未年检、未接受处罚机动车。

8.5 车牌识别在 SRE 系统中的优点

1、高速：把不高于时速 120Km 的汽车车牌号码自动识别出来的时间小于 0.8 秒，并将车牌号数据实时传送至车辆管理中心。

2、高识别率：采用相关的演算当作基本技术的独特算法，无论半天或夜间都能够保持较高的自动识别率。

3、软硬结合，独立工作：系统自动完成牌照的识别补光、拍像、识别、传输、存储等过程。

4、元素识别齐全：对颜色、汉字、字母、数字、两行字的车牌均能识别并且识别率较高。

5、全天候工作：解决影响牌照识别率的气候、环境、灯光等因素。

9、结束语

电子警察系统的核心技术是车牌识别，而影响车牌识别率因素很多，事实上车牌自动识别系统所涉及的技术指标众多，除了在设计核心外，还有实施经验、外在环境等对车牌识别都有影响，但随着电子警察的广泛应用，在智能交通系统中溶入多车牌识别系统已成为必然。未来的电子警察系统建设应以通信网络为基础，整合通信、安防、计算机等领域的高新技术，合理优化布设监测电子警察岗，将系统建成集交通信息采集、识别、处理、存储、管理与应用于一体的管理平台，通过自动化的电子警察系统有效对覆盖交通主干道、快速路系统和连接城市间高速公路，市郊省道、国道出入口的智能交通监测系统。电子警察系统获取的交通信息不仅可以为交通管理者提供决策依据，而且通过实时动态的信息发布，其直接受益者将是所有社会公众。交管部门将采集到的交通信息经过处理后，通过广播、电话、互联网等多种形式及时、快捷地发布给交通参与者，交通参与者可以利用这些全方位。多角度、多模式的交通信息制定和调整自己的出行规划。 **中**

P. 117