With developed new deep learning technology, the research team led by Prof. Xiaogang Wang achieved 99.47% face recognition accuracy on the most well face recognition benchmark (Labeled Faces in the Wild). It is the highest in the world and outperforms the performance of human eyes (99.20%).

「認人」準過肉眼 中大系統冠全球

■中大自動人面識別系統利用深度學習模型進行人面配對。 中大供圖

香港文匯報訊（記者 歐陽文倩）現在的智能手機有人面偵測保安，於社交平台上載相片也能替你識別到相中人是誰，這些都是了不起的尖端技術，但與真人親自以肉眼「認人」相比還相差一截。不過，中文大學就研發出一套嶄新的自動人面識別系統，準確度達全球之冠，於人面資料庫（Labeled Faces in the Wild）過千組不同光暗、表情及拍攝角度的人面照片中，識別容貌的準確率高達99.15%，更是首次有系統可超越人眼識別的準確度。

棄傳統數據 自製模型

有關研究團隊由中大信息工程學系教授湯曉鷗及電子工程學系教授王曉剛領導。王曉剛解釋，業界於人面識別方面主要都是沿用同一個數據模型去做估算，再用大量相片建立數據庫，但有關模型其實並不夠「針對性」，幾乎可用於所有圖像分析。

因此，中大的團隊另闢蹊徑，打開這個業界「黑盒子」，將當中人面分析的要素融入自己的設計當中，製作出專門用來識別人面的模型，終於突破瓶頸。王曉剛表示：「這要考慮很多因素，例如如何去克服同一個人因光照、表情、化妝或年齡等因素而引起的差異，以及人和人之間長得比較相似時又可以如何分辨。」

模擬大腦教系統「帶眼識人」

中大研究團隊於當中所下的其中一大工夫，就是透過模擬大腦行為，建構神經網絡，透過深度學習（Deep Learning）的方式讓系統學會「帶眼識人」。王曉剛解釋：「其實人的視覺也是有層次的，有六七層之多，我們的系統的網絡層次也很深，低層的分析像素，然後是把像素組成眼耳口鼻，最高層次就是識別人。我們讓它「看」很多不同的相片，再跟它區分每張相片是哪個人，透過大量的數據，還有非常複雜的計算模型，讓它之後也能辨識出沒有見過的人。」

■王曉剛解釋，這次中大團隊突破業界瓶頸，製作出專門用來識別人面的模型。 中大供圖

而中大設立的CUDA（統一計算設備架構）科研中心，成功加強相關電腦運算能力，「以往做有關實驗，每次需時1個月，現時我們透過GPU（圖形處理器）運算，識別一張相片只要35毫秒」。

應用廣泛 辨大量目標助執法

這個「世界第一」的人面識別技術應用層面廣泛，在公共安全、執法、互聯網和娛樂等範疇均可發揮極大功效，例如執法部門及保安單位可利用此技術，從數以萬計的人群中找出目標人物。傳統的視頻監控只可在簡單環境中監測小量目標，而新識別系統則能在極複雜環境下辨認大量目標。
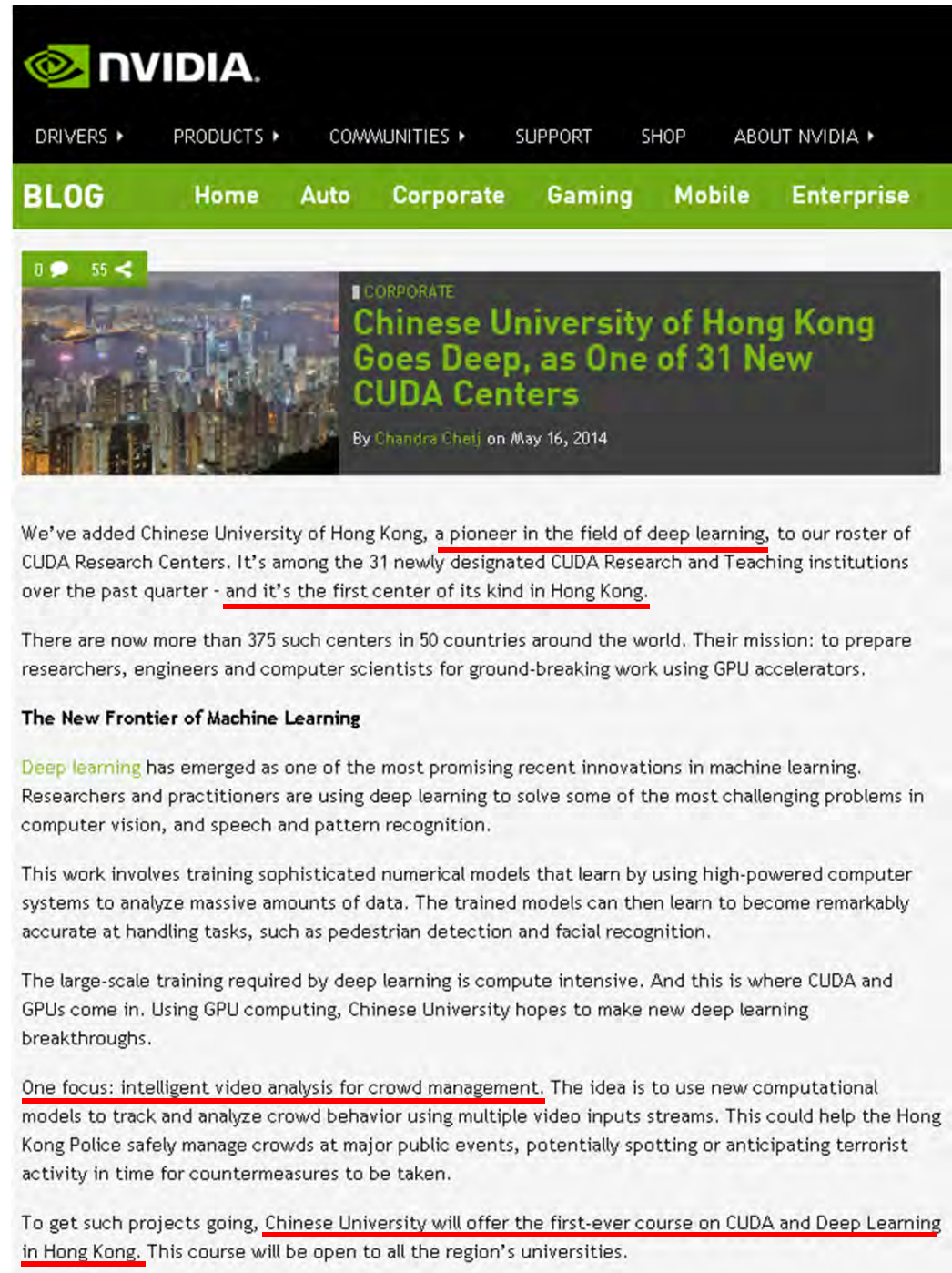
王曉剛亦表示：「現時有很多公司在和我們談合作，目前我們最大的考慮，是如何進一步發展核心技術，取得更多資料去進行分析。」

The research team led by Prof. Wanli Ouyang and Prof. Xiaogang Wang Ranked No. 2 in ImageNet Object Detection Challenge 2014. ImageNet is the most well known challenge in computer vision. 38 top computer vision groups in the world participated in the competition, including Google, Baidu, Microsoft, IBM, Oxford, Berkeley, and Stanford

—No. 1: Google
—No. 2: CUHK
—No. 3: Baidu

IMAGENET

Recognizing CUHK as a pioneer in the field of deep learning, NVIDIA established the CUDA research center at CUHK. This is the first CUDA research center in Hong Kong. Prof. Xiaogang Wang is the director.

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■ CORPORATE
Chinese University of Hong Kong Goes Deep, as One of 31 New CUDA Centers

By Chandra Cheij on May 16, 2014

We've added Chinese University of Hong Kong, a pioneer in the field of deep learning, to our roster of CUDA Research Centers. It's among the 31 newly designated CUDA Research and Teaching institutions over the past quarter - and it's the first center of its kind in Hong Kong.

There are now more than 375 such centers in 50 countries around the world. Their mission: to prepare researchers, engineers and computer scientists for ground-breaking work using GPU accelerators.

The New Frontier of Machine Learning

Deep learning has emerged as one of the most promising recent innovations in machine learning. Researchers and practitioners are using deep learning to solve some of the most challenging problems in computer vision, and speech and pattern recognition.

This work involves training sophisticated numerical models that learn by using high-powered computer systems to analyze massive amounts of data. The trained models can then learn to become remarkably accurate at handling tasks, such as pedestrian detection and facial recognition.

The large-scale training required by deep learning is compute intensive. And this is where CUDA and GPUs come in. Using GPU computing, Chinese University hopes to make new deep learning breakthroughs.

One focus: intelligent video analysis for crowd management. The idea is to use new computational models to track and analyze crowd behavior using multiple video inputs streams. This could help the Hong Kong Police safely manage crowds at major public events, potentially spotting or anticipating terrorist activity in time for countermeasures to be taken.

To get such projects going, Chinese University will offer the first-ever course on CUDA and Deep Learning in Hong Kong. This course will be open to all the region's universities.