Innovation at HKUST

科大的創新成就

Chamber members explore technological innovation
in construction, multimedia, and healthcare

總商會會員探索建築、多媒體和醫療方面的技術創新

Innovation and technology are seen as key areas for any economy to raise its competitiveness and development.
In 2009, Chief Executive Donald Tsang announced in his Policy Address support for six new pillar industries to strengthen Hong Kong's economy. Two of which were innovation & technology, and cultural & creative industries. On the surface of things, it could be argued not a great deal is being done. But at the Hong Kong University of Science and Technology, researchers and students are pushing the boundaries of innovation and technology.

To see what commercial applications its technology could have, 22 Chamber members visited HKUST on May 3. Led by Industry and Technology Chairman
Edmond Yue, members visited the university's Materials Research Lab, Controlled Environment Test Facility, Multimedia Technology Research Centre,
and its Hair Drug Testing Lab.
Yue said it is vital for Hong Kong to build up its expertise in innovation and technology, and cited HKUST as a driving force in honing our future competitiveness.

Curing Wi-Fi Blues

科大研製無線多跳網絡軟件「簡捷網」

We all know how frustrating fading Wi-Fi signals can be, so to address this a research team at the Department of Computer Science and Engineering, HKUST, has invented and developed a new multi-hop wireless mesh network that strengthens Wi-Fi signals by as much as 100 times. The network software, called LAviNet, implements a set of innovative channels and routing algorithms to automatically select paths which effectively avoid traffic congestion and reduce signal interference.

Current Wi-Fi signals can be blocked or significantly weakened by physical barriers or objects. Where large areas need to be networked, cabling is not always possible. Wen Huang, Engineering Manager at the department, explained that the LAviNet solves this problem without the need to upgrade or buy more hardware. The software is installed into most Wi-Fi access points and wireless routers, which then maximizes wireless coverage areas and improves operation efficiency. The technology has successfully completed trials at Boeing Seattle, and is undergoing trials at Hong Kong's HAECO as well as Modern Terminals.

眾所周知，Wi-Fi無線訊號不斷減弱是多麼令人洩氣。為此，科大計算機科學及工程學系的研究團隊研發了全新的Wi-Fi無線多跳網絡軟件「簡捷網」，大幅提升Wi-Fi無線訊號的強度達100倍。該軟件採用嶄新的智能訊道分配算法，能自動選取路徑，靈活避開干擾及擠塞區域。

現時，Wi-Fi無線訊號或會因四周的屏障或物件而中斷或大幅減

Streamphony, another technology that the department has developed, is a push-based overlay streaming network, designed to improve the streaming capabilities of online videos and games. One of the reasons why streaming video has been struggling to take off is that the picture breaks up, freezes or hangs completely as servers and bandwidth cannot handle demand.

Expanding servers and bandwidth can be a very costly exercise. Streamphony pushes signals to reliable proxy servers all over the internet, from which users can stream their video or play games, instead of connecting directly to the host server. The system reduces bandwidth requirements and has a host of applications, from streaming TV to webinars, stock quotes, as it also significantly speeds up data transmission.

弱。假如廣大地區要連接網絡，鋪設電纜會存在困難。該學系工程項目經理黃文解釋，用戶無需購買任何硬件或進行升級，都可以利用「簡捷網」解決這個問題。「簡捷網」可以配合大部分Wi-Fi接入點及網絡路由器（router），擴大無線網絡覆蓋面，大大提升營運效益。這項技術已經在波音公司成功通過實地測試，現正在本港的香港飛機工程和現代貨箱碼頭等企業進行試驗。

該學系開發的另一技術Streamphony是推送式的覆蓋串流網絡（push-based overlay streaming network），專門改善網上影片和遊戲的串流功能。串流影片一直難以興起的原因之一，是當伺服器和頻寬未能應付用戶需求，影像就會斷開、停滯甚或完全當機。

擴大伺服器和頻寬或會非常昂貴。Streamphony可以把訊號推至互聯網上各個可靠的代理伺服器，用戶只需在這些代理伺服器上串流影片或玩遊戲，無需直接連接主機伺服器。這個系統可降低頻寬需求，還可大大加快數據傳送的速度，從而提供串流電視、參加網絡研討會（webinar）和股票報價等多個應用功能。

詳情瀏覽 For more information, visit http://mwnet.cse.ust.hk/lavinet/ and 及 http://mwnet.cse.ust.hk/streamphony/