

## 教育部-微软重点实验室阶段性建设报告（2004.11 - 2006.4）

注：该总结将由微软亚洲研究院收集后，整理一并报教育部科技司审阅。请各合作单位用中文认真填写。请联合实验室相关负责人填写本报告，并请所有项目负责人填写联合项目报告（附件2）

提交日期：\_\_\_\_\_年\_\_\_\_月\_\_\_\_日

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基本信息				
实验室名称	信息技术 教育部-微软重点实验室		实验室网站	
承建单位	大学名称	HKUST	地址	Clear Water Bay, Kowloon, Hong Kong
	学院名称	香港科技大学		
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成果概述				
本阶段主要成果概述	请概述本实验室本阶段在科研、人才培养等方面的主要成果。（500 字左右）			
	<p><b>Computer vision and computer graphics:</b></p> <p>Our laboratory has published a lot of quality work in some of the top international conferences (e.g. ICCV, CVPR, ECCV, SIGGRAPH, ICML, etc.) and journals (PAMI, TNN, etc.). All of them have been giving impact to the field of Computer Science and producing contribution to the society/industry. For example, while digital entertainment and film industry are demanding useful, convenient and powerful tools for development, our laboratory has researched and produced a set of unique techniques for their desire. Poisson Matting, Lazy Snapping, Image/Video Repairing and Shadow Extraction/Matting are some examples that can help produce various and</p>			

unique special effects and manipulations. While 3D scanning of real world object requires expensive and difficult setting, Dense Photometric Stereo is a breakthrough, which provides a way to capture accurate 3D surface information with a very cheap and simple experimental setting.

### **Databases:**

WinyDB is an embedded query processing system on Windows CE .NET based PDAs (Personal Digital Assistants) for extracting information from a network of wireless, smart sensor nodes. Multiple PDAs running WinyDB can communicate with one another and query the local sensor network as well as remote sensor networks. Also, WinyDB is optimized for the power efficiency of both PDAs and sensor networks.

### **Networking and System:**

We have focused on Wireless Sensor Network, Wireless Mesh, Peer-to-Peer Networking, and result in many publications in top conferences such as INFOCOM, ICDCS, IPTPS, ICNP, and top journals, such as TPDS, TM, JSAC, TC and so on. All these results have significant impact to this field. For example, there have been tremendous advances in wireless communications in recent years, including in wireless radios, networks, and mobile devices. It is expected that different radio technologies, including WiFi (IEEE 802.11), UWB (IEEE 802.15.3), WiMAX (IEEE 802.16), ZigBee (IEEE 802.15.4), Bluetooth, 3G, and SDR will coexist. Meanwhile, the existing network infrastructure of planned cellular networks is being complemented by heterogeneous self-organizing systems with hybrid infrastructure and peer-to-peer communication modes. Moreover, multi-band/multi-radio devices have been rapidly emerging recently. In short, we can see much diversity in terms of radios, networks, and devices, which provide much flexibility in radio resource configuration and management. The key question that needs to be answered, then, is how do we ensure that users always have the “best” networking in such complicated situations?

Target at those challenges, we introduce a “collaborative and cognitive networking” concept and develop core technologies for radio resource management to address all the above challenges. More specifically, we investigate the following fundamental issues: A. To investigate the effects of “collaborative” and “cognitive” on the overall system performance. Here, by “cognitive” we mean the ability to sense the situation, adapt to the environment, and even reconstruct the network to improve the overall system performance. By “collaborative” we mean the ability to work together with neighboring devices to accurately understand the operating environment and take corresponding actions in a distributed way. Specifically, cross-layer adaptation for single device and collaborative coordination among a group of devices will be studied. B. As the sample enabling technologies, we investigate several concrete schemes that can demonstrate the idea of cross-layer design and device coordination in collaborative and cognitive networks. In particular, how do we manage devices equipped with multi-radio in distributed systems like multi-hop networks (e.g., mesh and sensor networks)?

科研成果总结				
研究院支持的研究项目	承担人	项目名称	开始日期	结束日期
	Qiong LUO	An Embedded Systems CFP (Call-For-Proposal) grant MCCL03/04.EG01 (WinyDB: An Embedded Query Processor for Sensor Networks, HK\$156K, from Microsoft Research Asia.	May 2004	May 2007
	Long QUAN	Dynamic Fine-Scale Geometry Modeling from Multiple Views, Grant MRA05/06.EG02, US\$10K, from Microsoft Research Asia.	Sep 2005	Sep 2007
	Yunhao LIU	“Trustworthy Distributed Computing”, Grant Microsoft MRA05/06. EG01, US\$ 60K, from Microsoft Research Asia.	July 2005	June 2008
	Lionel M. Ni (Co-I, PI is Prof. Jianzhong Li of Harbin Institute of Technology)	Middleware and Data Management for Sensor Networks, NSF of China/MSRA (60533110), RMB\$2,000,000.	Jan 2006	Dec 2009
双方联合申请的项目	承担人	项目名称	开始日期	结束日期
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本阶段共发表文章 **70** 篇

实 验 室 相 关 的 人 才 培 养 成 果, 如 论 文 获 奖, 参 加 相 比 赛	姓名	学历	比赛名称及获奖情况
	Qian Zhang	PhD	Best Paper Award at QShine 2006
	Ting Cham-ho and Chan Kin-kong	HKUST MPhil	Top prize at Student Track category of the Microsoft Server Championships in 2006
	Haibo Hu and Manli Zhu	HKUST PhD Candidate	4th Runner-up out of 20 teams at Microsoft Imagine Cup 2004
	Xing Jin	HKUST PhD Candidate	Microsoft Fellowship 2005
	Yanmin Zhu	HKUST PhD Candidate	Microsoft Fellowship 2005
	Wai-Hung Tsang	HKUST PhD Candidate	Microsoft Fellowship 2005
	Jian Ma	HKUST PhD Candidate	Microsoft Fellowship 2004
	Dou Shen,	HKUST PhD Candidate	Microsoft Fellowship 2004
	Yichen Wei	HKUST PhD Candidate	Microsoft Fellowship 2004

	Xinyan Zhang	HKUST PhD Candidate	Microsoft Fellowship 2004
<b>其他成果总结</b>			
<b>其 成 及 新 其 他 成 果 创 点</b>	<p>如果有组织学术会议、培训活动等，请列举会议名称、时间、参加人数、活动亮点等。如果有相关技术原型设计、专利等，请列举。</p>		
	<p>举行第七届年度“21世纪无处不在的计算”学术研讨会（2005年11月5日），由微软亚洲研究院，香港科技大学以及国家自然科学基金委员会联合举办。本届会议的主题为“以数据为核心的计算”——在数据终端建立以数据为核心的计算模型，计算过程以及数值计算。会议邀请了计算领域的知名专家，其中包括图灵奖获得者，美国国家科学院以及美国国家工程院院士。这些学术界以及工业界的带头人与大家分享了他们对“以数据为核心的计算”远景的观点。超过700名师生参加了本次研讨会，主会场和分会场均爆满。</p> <p>链接： "Data-Centric Computing", Computing in the 21st Century, HKUST, Nov 5, 2005. <a href="http://research.microsoft.com/asia/21stcomputing/hk.htm">http://research.microsoft.com/asia/21stcomputing/hk.htm</a></p>		

**附件：**

需要特别说明的材料（包括证明、报道、文章等）可用附件的形式提交。