Envision Future Computing Computing For The Future

Department of Computing
Department Brochure
2016/17
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Vision

The Department is determined to assert its position as the leader in interdisciplinary research and education in computing, generating worldwide impact and benefit to mankind.

Mission

To nurture graduates who will become leaders and professionals with a global outlook, ready to serve in the society of tomorrow with advanced knowledge and skills in computing and related areas.

To conduct world-class research and promote interdisciplinary collaboration, expanding the horizon of knowledge discovery and technology advancement.

To contribute and deliver professional services to the community at large with strong partnership and collaboration.
Head’s Message

When you think about computing, you are likely to think of hardware and software, and perhaps source code. But computing involves so much more. Consider the smartphone. You no longer use a phone just for talking – you can also take photos, write emails, connect to social networks, schedule meetings, play games and so on. In this way, computing is altering the way we communicate, think and even live. You may retain a mostly traditional lifestyle, but the convenience provided by computing in your daily life is undeniable. That convenience will only become more obvious, considering the fast advances in research on big data, artificial intelligence, robotics, augmented reality, and many more areas. Computing now has been immersed in every corner of our daily life. With the latest advances in ICT technologies, the era of smart computing is approaching fast. Smart buildings, smart transportation, smart education, smart healthcare and even smart homes will soon improve most aspects of our lives.

In the Department of Computing, with our slogan “Envision Future Computing and Computing for the Future”, we are committed to becoming influential players in such advances, building on interdisciplinary education and research to improve both our own society and the wider world. I wish to share my sincere pride and enthusiasm for this wonderful department.

As the first step in that process, we put enormous effort into nurturing our students to become leaders and professionals with global outlooks. Our Broad Discipline of Computing for undergraduates includes application-oriented programmes that equip them with the knowledge and skills to meet the ever-changing needs of society. Our exchange programmes and study tours enrich their learning experience at a global level. We also stretch undergraduates with our unique Challengers Programme. In this programme beyond normal curriculum, students develop creativity, innovativeness, leadership, teamwork and communication skills through theme-based activities in programming contests, undergraduate research and entrepreneurship. Internship opportunities further allow students to apply what they have learned with us in real work environments.
At the postgraduate level, we offer taught master programmes for working professionals from a diversity of backgrounds, and research-oriented master and doctoral programmes for those who want to further enrich their research experience.

Our research is strategically focused on two major areas: big data computing and human-centered computing, covering cloud computing, mobile computing, data analytics and processing, cognitive computing and security. It fosters technological advancement, knowledge transfer and high-impact outcomes for both academia and industry.

We have established strong connections with partners such as Microsoft, Yonyou, IBM and Sun Yat-sen University through joint laboratories in prime areas of computing. The joint labs embark on a long-term collaboration between PolyU and our partners in research and education, work-integrated learning, and promote further collaboration between the academia and the IT industry. Through active collaboration in various forms, we have produced commercial and industrial solutions that are helping to change the world.

Computing is the magic that turns today's seemingly impossible needs into tomorrow's realities. With computing technology advancing so rapidly, what do you think the future will look like?

To imagine how we will be living ten years from now, you just need to be daring. Why not embark on an exciting research and collaboration journey with us? We look forward to hearing from you and joining us to explore a world of opportunities.

Together, we drive innovation through smart computing and can shape the future!
Our Strong Team

Chair Professor and Head
Prof. CAO Jiannong
BSc(Nanjing); MSc, PhD(Washington State); FIEEE; MACM; SMCCF
Front row, middle

Associate Professor & Associate Head
Dr SHAO Zili
BEng, MEng(Electronic Science & Technology of China); MSc, PhD(Texas at Dallas)
Front row, 3rd from left

Associate Professor
Dr CHAN Chun Bun Henry
BA, MA(Cambridge); PhD(British Columbia); MIEEE
Back row, 3rd from left

Assistant Professor
Dr AU Man Ho Allen
BEng, MPhil(CUHK); PhD(Wollongong); MIEEE
Back row, 1st from right

Chair Professor
Prof. ZHANG Dapeng David
BSc(Peking); MSc, PhD(Harbin IT); PhD(Waterloo); FIEEE; FIAPR
Front row, 2nd from right

Professor
Prof. BACIU George
BMath, MAsc, PhD(Waterloo); MACM; MIEEE
Back row, 4th from left

Associate Professor
Dr LI Wenjie Maggie
BSc, MSc(Tianjin); PhD(CUHK); MACM; MIEEE
Back row, 1st from left

Assistant Professor
Dr GUAN Nan
BE, MS(NEU); PhD(Uppsala); MIEEE
Front row, 1st from right

Professor & Associate Head
Prof. ZHANG Lei
MSc, PhD(Northwestern Polytechnical)
Front row, 3rd from right

Professor
Prof. CHAN Chun Chung Keith
BMath, MAsc, PhD(Waterloo)
Front row, 1st from left

Associate Professor
Dr NG To Yee Vincent
BSc(Simon Fraser); MMath(Waterloo); PhD(Simon Fraser)
Back row, 4th from right

Assistant Professor
Dr PEI Yu Max
BSc, PhD(Nanjing); PhD(ETH Zurich)
Back row, 2nd from right

Associate Professor & Associate Head
Dr CHUNG Fu Lai Korris
BSc(Manitoba); MPhil, PhD(CUHK); MIEEE
Back row, middle

Associate Professor
Dr CHAN Chi Fai Stephen
BSc, MSc(Rochester); MSc(Wisconsin-Madison); PhD(Rochester); MIEEE; MACM
Front row, 2nd from left

Associate Professor
Dr NGAI Grace
ScB(Brown); MSE, PhD(Johns Hopkins)
Back row, 2nd from left

Assistant Professor
Dr SHIU Chi Keung Simon
MSci(City U.K.); MSci(Newcastle U.K.); PhD(PolyU(HK)); MBCS; MACM; MHKCS; MIEEE
Back row, 3rd from right
COMP: Icon of Smart Computing

Smart computing is emerging as an important multidisciplinary area, which effectively makes use of computer hardware, software, social media and communication networks together with digital sensors, smart devices, internet technologies, big data analytics, computational intelligence and intelligent systems to realise various innovative applications. Smart computing can be broadly classified into two major areas: how to design and build smart computing systems and how to use computing technology to design smart things and make human life better. Applications of smart computing span across different areas, such as business, healthcare, environmental protection, security, entertainment, and social activities. The advancement of cloud computing, pervasive computing and social computing are bringing smart computing to a newer dimension and improving our ways of living.

We position the Department as the icon of SMART COMPUTING and it becomes our Department-Driven Initiatives. Defining different levels of needs and addressing the global challenges by exploiting our strengths and specialisation, we synergise individual expertise and effort to these concerted initiatives, thus generating collective interdisciplinary research impacts and application value. High targets are set to create industrial recognition, build reputation and acquire academic merits in the technology communities.
Smart Computing is driving the next wave of IT growth. COMP continues to play a leading role in fostering the development of smart computing. In 2014, COMP hosted “SMARTCOMP 2014”, the first international conference on smart computing, with the theme “Innovation and Applications through Smart Computing”. The conference provided a platform for researchers, engineers and vendors from different disciplines to exchange ideas and experience, identify future directions and challenges, and explore collaborative research and system development for smart computing. It significantly benefited a large variety of audience from both academia and industry.
Department-Driven Initiatives

The Department aims at a Centre of Excellence in Smart Computing, not only solving a single problem but targeting at a theme – Smart Cities, with applications focused on aspects of Smart Healthcare and Smart Living. Under this four-level structure, impactful projects are developed to address different challenges.
Three-tier Strategic Research Framework

The Department of Computing concentrates on high-quality, interdisciplinary research which aims at creating new computing related knowledge and benefits for the entire world, we have established a three-tier framework with a common research infrastructure for achieving that goal.

Tier 1 of this framework comprises department-driven strategic research within focused areas of application according to two themes: big data analytics and human-centred computing.

Tier 2 provides a backbone for Tier 1, dividing our efforts into areas of departmental research expertise, including big data analytics and information retrieval; graphics, visualisation and multimedia; human-centred computing; networking and mobile computing; pattern recognition and machine intelligence; and systems and software engineering.

Tier 3 comprises our crossarea research centres and laboratories through which we establish strong connections with well-known researchers and world-leading teams.
Tier 1: Strategic Themes

Tier 1 of our strategic research framework focuses our overall research efforts on the dual themes of big data analytics and human-centred computing, shaping our drive to provide ground-breaking innovations in truly smart computing.

Big Data Analytics

Taming the rapid and exponential growth of data in constantly changing forms is a daunting task for corporations, other organisations and governments around the world. Traditional data processing techniques and database management tools are no longer viable, with limitations in acquisition, analysis and visualisation, information retrieval and knowledge discovery.

Yet effective big data analytics promises the capacity for enhanced decision making, greater operational efficiency and reduced costs. The Department is focusing on both theoretical and application issues in this field. For instance, we are applying distributed computing technology to tackle the sheer volume of data and investigating the efficient retrieval of semantic and other language specific information.

Human-Centred Computing

Human-centred computing focuses on computing and computational technologies that account for behavioural, physical, social and cultural contexts. Expertise is gathered from a broad range of areas, including cognitive science, communication studies, computer science, graphic design, human-computer interaction, information technology, psychology, sociology and system development.

Our focus on human-centred computing can be divided into two categories: efforts to understand humans through their actions using existing computational technologies, and the development of new technologies to enhance those actions.
Tier 2: Areas of Expertise

Tier 2 of our strategic research framework provides the backbone to Tier 1, grouping the existing strengths of our faculty members and research personnel into six clearly defined areas of departmental expertise in which they produce globally recognised research achievements.

**Big Data Analytics and Information Retrieval**

Our researchers understand the urgent need to develop reliable new technologies, methods and tools for processing ever-changing big data. Among other areas, their investigations cover parallel databases as services, data accountability and service outsourcing, data and communicative behaviour in online social networks, search engine indexing, transfer-learning methods for multisource data sets, and social media big data analysis.

**Graphics, Visualisation and Multimedia**

Multimedia combines contents such as sound, images and graphics to make applications dynamic in areas such as education, entertainment, social networking and telemedicine. With the explosion of multimedia information in daily lives around the world, the key research challenges lie in managing complex multimedia objects and extending them into higher dimensions with the capacity for real-time interaction. Our researchers focus on three-dimensional computer graphic modelling and rendering, distributed three-dimensional graphic, image and video quality enhancement, content-based image retrieval, and multi-sensor data and motion analysis.

**Human-Centred Computing**

Drawing on methods developed in a range of scientific, social science and design fields, our researchers are using computational technologies to analyse human actions and stimulate performance enhancement in numerous areas. Their major work covers brain informatics, ubiquitous computing, human-computer interfaces and social computing.

**Networking and Mobile Computing**

Wireless networks and smart mobile devices have undergone startling advancements in recent years, now offering users the flexibility and freedom of mobile computing almost anywhere at any time. Especially in the last decade, computer networks have become faster, more reliable and wider in their coverage. Our researchers keep well abreast of such advancements, devoting their efforts to distributed and parallel computing, mobile application security, mobile cloud computing, network performance monitoring and measurement, wireless sensor networks and vehicular networks. Their solutions now feature in intelligent transportation systems, structural healthcare, localisation, and security applications.
Pattern Recognition and Machine Intelligence

Pattern recognition, or the classification of measurements and observations, is significantly enhanced through the application of computational intelligence techniques. With surging demand for efficient and high-performance automated pattern recognition, breakthroughs are being made in emerging areas such as bioinformatics and computational biology, evolutionary computing, social media mining, soft computing and web intelligence, among others. Departmental researchers are currently undertaking important work in deep learning biometric security, computer visio, robotics, video and image processing, data mining, ontology representation and decision making.

Systems and Software Engineering

Systems and software engineering involves the development of methodologies, processes and tools for building robust, high performance computer-based systems. In this area, our researchers have applied their expertise to key challenges in agile development, context-aware middleware, cost estimation, cyber-physical systems, real-time embedded systems, software metrics, software processes and quality, storage in embedded systems and risk management. They are also working on solutions to the problems arising from the use of business-critical applications.
Tier 3: Research Centres and Laboratories

Tier 3 of the Department’s strategic approach to research includes crossarea research centres and laboratories in which interdisciplinary work is conducted on strategic applications that are in high demand. Strong partnerships established with local and international academic institutions and industry players are noteworthy here, allowing us to establish joint laboratories and successfully complete projects with high impact and significance.

- Cyber Security and Privacy Lab
- Internet and Mobile Computing Lab
- Biometrics Research Centre
- Computer-Human Interaction (CHI) Lab
- Laboratory for Software Development & Management
- Human Language Technology Lab
- Visual Analytics Lab
- Cognitive Computing Lab
- Cyber-Physical Systems (CPS) and Embedded Systems Lab
- Pervasive Visual Computing Lab
## Record of Research Outputs and Awards

<table>
<thead>
<tr>
<th>Research Outputs</th>
<th>2012-2016</th>
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<tr>
<td>No. of MPhil Student</td>
<td>24</td>
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<tr>
<td>No. of PhD Student</td>
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<td>Research Books or Monograph</td>
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<td>Book Chapters</td>
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<table>
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<tr>
<th>Research Outputs</th>
<th>2012-2016</th>
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<tbody>
<tr>
<td>Journal Papers</td>
<td>489</td>
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<tr>
<td>Conference Papers</td>
<td>392</td>
</tr>
<tr>
<td>Patents</td>
<td>26</td>
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<tr>
<td>Projects</td>
<td>164</td>
</tr>
</tbody>
</table>

### Highlight of Award-Winning Research (2010-2016)

<table>
<thead>
<tr>
<th>Award Description</th>
<th>Year</th>
<th>Awardee</th>
</tr>
</thead>
</table>
Project: Building a Personalized, Auto-Calibrating Eye Tracker from User Interaction | 2016 | Dr CHAN Chi Fai Stephen  
Dr LEONG Hong-Ya  
Dr NGAI Grace  
Mr HUANG Michael  
Ms KWOK Tiffany |
| Special Merit Award and Silver Medal, The 44th International Exhibition of Inventions of Geneva  
Project: Smart Fetal Monitoring Belt | 2016 | Prof. YOU Jia Jane |
| 2014 Higher Education Outstanding Scientific Research Output Awards - Natural Science Award (Second Class), Ministry of Education  
| Silver Award: Best Digital Inclusion (Service Stream), Hong Kong ICT Awards 2014  
Project: A Mobile Computing Centre: A Lab in a Suitcase on a Tuktuk | 2014 | Dr CHAN Chi Fai Stephen  
Dr NGAI Grace  
Mr HUANG Erwin (WebOrganic) |
| Best Paper Award, The 11th IEEE International Symposium on Parallel and Distributed Processing with Applications  
Project: Local Monitoring and Maintenance for Operational Wireless Sensor Networks | 2013 | Prof. CAO Jiannong  
Dr WANG Guojun  
Dr M.Z.A Bhuiyan (Central Shout University)  
Prof. WU Jie (Temple University) |
| IET Computer Vision Premium Award, IET Computer Vision  
Paper: Robust Mean-Shift Tracking with Corrected Background-Weighted Histogram (Vol. 6, Issue 1, pp. 62-69, 2012) | 2013 | Prof. ZHANG Dapeng David  
Prof. ZHANG Lei  
Prof. WU Chengke (Xidian University)  
Mr NING Jifeng |
| Certificate of Merit: Best Innovation & Research (Postgraduates & Open) and Special Mention (Social Responsibility): Best Innovation & Research (Postgraduates & Open), Hong Kong ICT Awards 2013  
Project: A Practical Wireless Structural Health Monitoring System using Intelligent Sensor Network | 2013 | Prof. CAO Jiannong  
Dr GUO Peng  
Dr LIU Xuefeng  
Mr LIU Yang  
Mr HE Zongjian |
## Highlight of Award-Winning Research (2010-2016)

<table>
<thead>
<tr>
<th>Description</th>
<th>Year</th>
<th>Awardee</th>
</tr>
</thead>
</table>
| **Best Paper Award, The 9th IEEE/IFIP International Conference on Embedded and Ubiquitous Computing** Project: Efficient Monitoring of Dynamic Tag Populations in RFID Systems | 2011 | Dr XIAO Bin  
Mr BU Kai  
Mr XIAO Qingjun |
| **Best Paper Award, 2011 IEEE Wireless Communications and Networking Conference** Project: Dual-Mote: A Sensor Network Testbed for High Rate Sensing-Transmission and Runtime Evaluation | 2011 | Prof. CAO Jiannong  
Dr LIU Xuefeng  
Dr WU Hejun (Sun Yat-sen University)  
Mr LIU Yang |
| **Qualcomm Award, The 19th ACM International Conference on Multimedia** Project: Bilinear Deep Learning for Image Classification | 2011 | Dr LIU Yan  
Dr LIU Yang  
Miss ZHONG Shenghua |
| **Special Prize and Gold Medal with Jury’s Commendation, The 39th International Exhibition of Inventions of Geneva** Project: An Innovative Secured Retinal Imaging System for Computer Aided Non-intrusive Diabetic Care | 2011 | Prof. YOU Jia Jane |
| **Best Paper Award (Honourable Mention) for 2010, Pattern Recognition Journal (Vol. 46)** Paper: Online Finger-knuckle-Print Verification for Personal Authentication (Vol. 43, Issue 7, pp. 2560-2571, Jul 2010) | 2010 | Prof. ZHANG Dapeng David  
Prof. ZHANG Lei  
Dr ZHU Hailong (Research Institute of Innovative Product & Technology, PolyU) |
| **Best Paper Award, SPIE Visual Communications and Image Processing** Project: Super-Resolution with Nonlocal Regularized Sparse Representation | 2010 | Prof. ZHANG Lei  
Prof. SHI Guangming (Xidian University)  
Prof. WU Xiaolin (McMaster University)  
Dr DONG Weisheng (Xidian University) |
Dr NG To Yee Vincent  
Dr NGAI Grace  
Miss CHEUNG Joey  
Mr CHOI Sam  
Miss LAU Winnie  
Mr TSE Jason |
| **Silver Medal, The 62nd iENA International Trade Fair for Ideas-Inventions-New Products** Project: Digital Image/Video Quality Enhancement System | 2010 | Prof. ZHANG Lei |
| **Silver Medal, The 38th International Exhibition of Inventions of Geneva** Project: Flexible RFID Encoder and Decoder (FRED) | 2010 | Dr CHAN Chun Bum Henry |
## Record of Research Grants (External)

<table>
<thead>
<tr>
<th>Highlight of Projects Secured External Research Grant (2012 - 2016)</th>
<th>Project Leader</th>
<th>Amount</th>
<th>Funding Scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordination and Computation in Distributed Intelligent MEMS</td>
<td>Prof. CAO Jiannong</td>
<td>HK$1,390,600</td>
<td>ANR/RGC Joint Research Scheme</td>
</tr>
<tr>
<td>Distributed Proactive Adaptation for Ubiquitous Interactive Objects</td>
<td>Prof. CAO Jiannong</td>
<td>HK$ 90,000</td>
<td>Germany/HK Joint Research Scheme</td>
</tr>
<tr>
<td>Searching and Browsing Cyber-Physical Objects</td>
<td>Prof. CAO Jiannong</td>
<td>HK$1,016,658</td>
<td>NSFC/RGC Joint Research Scheme</td>
</tr>
<tr>
<td>Efficient Algorithms for Graph Modification Problems</td>
<td>Dr CAO Yixin</td>
<td>HK$ 726,075</td>
<td>RGC Early Career Scheme (ECS)</td>
</tr>
<tr>
<td>Distributed Winner-Take-All for Competitive Control of Networked Systems</td>
<td>Dr LI Shuai</td>
<td>HK$ 776,075</td>
<td>RGC Early Career Scheme (ECS)</td>
</tr>
<tr>
<td>Design, Analysis, and Implementation of Efficient RFID Protocols</td>
<td>Dr ZHENG Yuanqing</td>
<td>HK$ 776,075</td>
<td>RGC Early Career Scheme (ECS)</td>
</tr>
<tr>
<td>Adversarial Traffic Analysis for Botnet Defense</td>
<td>Dr LUO Xiapu Daniel</td>
<td>HK$ 620,100</td>
<td>RGC Early Career Scheme (ECS)</td>
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<tr>
<td>An Online Risk Confinement, Assessment, and Mitigation Framework for Wireless-Enabled Medical Cyber-Physical Systems</td>
<td>Dr WANG Qixin</td>
<td>HK$ 763,087</td>
<td>RGC Early Career Scheme (ECS)</td>
</tr>
<tr>
<td>Dynamic Computation Partitioning for Multi-user Mobile Cloud Applications</td>
<td>Prof. CAO Jiannong</td>
<td>HK$ 845,033</td>
<td>RGC General Research Fund (GRF)</td>
</tr>
<tr>
<td>Exploratory Domain Adaptation Learning: Getting Suggestions from Existing Domains</td>
<td>Dr CHUNG Fu Lai Korris</td>
<td>HK$ 496,028</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>Leveraging Modern CPUs for Efficient Query Processing on Time Series Data</td>
<td>Dr YIU Man Lung Ken</td>
<td>HK$ 695,861</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>Joint Learning of Synthesis and Analysis Dictionaries for Image Reconstruction and Classification</td>
<td>Prof. ZHANG Lei</td>
<td>HK$ 696,029</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>Context-Aware Spatio-Temporal Modeling for Object Tracking in the Wild</td>
<td>Prof. ZHANG Dapeng David</td>
<td>HK$ 695,861</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>Bridging I/O Performance Gap for Big Data Workloads: A New NVDIMM-Based Approach</td>
<td>Dr SHAO Zili</td>
<td>HK$ 871,036</td>
<td>RGC General Research Fund (GRF)</td>
</tr>
<tr>
<td>Making Sense of Social Media Streams through Text Summarization</td>
<td>Dr LI Wenjie Maggie</td>
<td>HK$ 525,000</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>The Importance of Being Unique from a Distance: Iris Recognition Under Less Constrained Environments</td>
<td>Dr PATHAK Ajay Kumar</td>
<td>HK$ 535,000</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
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<tr>
<td>A Multi-Dimensional Approach in Reader Emotion Modeling and Prediction</td>
<td>Prof. LU Qin</td>
<td>HK$717,894</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>Mobile Virtualization Optimization Using Emerging Non-Volatile Memory</td>
<td>Dr SHAO Zili</td>
<td>HK$912,500</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>Thinking Across Domain Boundaries: A Composition Framework for Wireless Mission-Critical Cyber-Physical Systems</td>
<td>Dr WANG Qixin</td>
<td>HK$525,000</td>
<td>RGC General Research Fund (GRF)</td>
</tr>
<tr>
<td>Scalable Retrieval Techniques for Massive High-Dimensional Data</td>
<td>Dr YIU Man Lung Ken</td>
<td>HK$717,894</td>
<td>RGC General Research Fund (GRF)</td>
</tr>
<tr>
<td>Computer-aided Personalized Medical Monitoring in Mobile Cloud Computing Environment</td>
<td>Prof. YOU Jia Jane</td>
<td>HK$716,167</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>Large Scale Metric Learning for Matching of Heterogeneous Multimedia Data</td>
<td>Prof. ZHANG Dapeng David</td>
<td>HK$900,000</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>The Importance of Being Unique from a Distance: Iris Recognition Under Less Constrained Environments</td>
<td>Dr PATHAK Ajay Kumar</td>
<td>HK$535,000</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>A General Scalable Framework for Integrating Big Data Programming Models with Unified Abstraction</td>
<td>Prof. CAO Jiannong</td>
<td>HK$525,000</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>Personal Identification using Contactless Live 3D Finger Scans</td>
<td>Dr PATHAK Ajay Kumar</td>
<td>HK$535,000</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>A Scalable and Modular Framework for Adaptive, Multimodal, Context-aware Interaction</td>
<td>Dr NGAI Grace</td>
<td>HK$360,250</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>From Image Quality Assessment to Perceptual Quality Preserved Image Restoration: A Perceptual Transform Learning Approach</td>
<td>Prof. ZHANG Lei</td>
<td>HK$670,500</td>
<td>RGC General Research Fund (GRF)</td>
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<td>Multi-scale Fabric Texture Acquisition, Manipulation, Classification and Retrieval</td>
<td>Prof. BACIU George</td>
<td>HK$316,500</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>Programming Model and Execution Framework for Developing Mobile Cloud Applications</td>
<td>Prof. CAO Jiannong</td>
<td>HK$930,420</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>Modeling Opinion Influence in Social Media Networks for Business Intelligence Applications</td>
<td>Dr LI Wenjie Maggie</td>
<td>HK$707,800</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>Highlight of Projects Secured External Research Grant (2012 - 2016)</td>
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<td>Explore a Novel Cross-Layer Interference Resistant Multiple Access Approach for WiFi Networks: System Design and Prototype Implementation</td>
<td>Dr LOU Wei</td>
<td>HK$ 525,000</td>
<td>RGC General Research Fund (GRF)</td>
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<tr>
<td>Automatic Performance Tuning of Spatial Indexes for Dynamic Workloads in Spatial Databases</td>
<td>Dr YIU Man Lung Ken</td>
<td>HK$ 537,500</td>
<td>RGC General Research Fund (GRF)</td>
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<td>Semi-Coupled Dictionary Learning for Image Cross-modality Transform and Recognition</td>
<td>Prof. ZHANG Dapeng David</td>
<td>HK$ 601,000</td>
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<td>A Unified Framework for Full Reference and No Reference Image Quality Assessment</td>
<td>Prof. ZHANG Lei</td>
<td>HK$ 930,425</td>
<td>RGC General Research Fund (GRF)</td>
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<td>A Simulation Environment for Pervasive Networking and Computing</td>
<td>Prof. CAO Jiannong</td>
<td>HK$ 1,243,000</td>
<td>RGC General Research Fund (GRF)</td>
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<td>Unconsciously Collaborative Crowd Intelligence Based Social Events Geo-Information Inference and Spatial Correlation Study</td>
<td>Prof. CAO Jiannong</td>
<td>RMB 3,823,800</td>
<td>National Natural Science Foundation of China (NSFC)</td>
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<td>Human Health Oriented Diagnostic Information Sensing and Computing</td>
<td>Prof. ZHANG Dapeng David</td>
<td>RMB 3,823,800</td>
<td>National Natural Science Foundation of China (NSFC)</td>
</tr>
<tr>
<td>Limited Communication Constrained Multi-robot Cooperation Based on Distributed Dynamic Neural Networks</td>
<td>Dr LI Shuai</td>
<td>RMB 342,900</td>
<td>National Natural Science Foundation of China (NSFC)</td>
</tr>
<tr>
<td>Traffic Transformation: Theory and Applications</td>
<td>Dr LUO Xiapu Daniel</td>
<td>RMB 299,160</td>
<td>National Natural Science Foundation of China (NSFC)</td>
</tr>
<tr>
<td>Combinatorial and algorithmic studies on cycles</td>
<td>Dr CAO Yixin</td>
<td>RMB 959,000</td>
<td>National Natural Science Foundation of China (NSFC)</td>
</tr>
<tr>
<td>On Managing TLC NAND Flash in Embedded Systems</td>
<td>Dr SHAO Zili</td>
<td>RMB 981,442</td>
<td>National Natural Science Foundation of China (NSFC)</td>
</tr>
<tr>
<td>Social Media Information Mining based on Deep Learning Framework</td>
<td>Dr LIU Yan Fiona</td>
<td>RMB 968,696</td>
<td>National Natural Science Foundation of China (NSFC)</td>
</tr>
<tr>
<td>Efficient Detection and Identification of Tags in a Large-Scale Dynamic RFID System</td>
<td>Dr XIAO Bin</td>
<td>RMB 968,696</td>
<td>National Natural Science Foundation of China (NSFC)</td>
</tr>
<tr>
<td>From Wired Sensor Networks to Wireless: Framework, Algorithms and Practice</td>
<td>Dr WANG Dan</td>
<td>RMB 997,200</td>
<td>National Natural Science Foundation of China (NSFC)</td>
</tr>
<tr>
<td>Content-Oriented Microblog Mining Based on Speech Act Recognition</td>
<td>Dr LI Wenjie Maggie</td>
<td>RMB 997,200</td>
<td>National Natural Science Foundation of China (NSFC)</td>
</tr>
<tr>
<td>Highlight of Projects Secured External Research Grant (2012 - 2016)</td>
<td>Project Leader</td>
<td>Amount</td>
<td>Funding Scheme</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
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<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Research on Interference Resistant Multiple Access Scheme for WLANs: Cross-Layer Protocol Design and Prototype Implementation</td>
<td>Dr LOU Wei</td>
<td>RMB1,022,130</td>
<td>National Natural Science Foundation of China (NSFC)</td>
</tr>
<tr>
<td>Facial Beauty Objectification Research</td>
<td>Prof. ZHANG Dapeng David</td>
<td>RMB1,009,665</td>
<td>National Natural Science Foundation of China (NSFC)</td>
</tr>
<tr>
<td>s-Helmet: A Proactive Construction Safety Management System based on Real-time Localization</td>
<td>Prof. CAO Jiannong</td>
<td>HK$ 1,138,500</td>
<td>Construction Industry Council (CIC)</td>
</tr>
<tr>
<td>Research on OTT Traffic Modeling and its Impact on Network Architecture</td>
<td>Dr CHANG Kow Chuen Rocky</td>
<td>HK$ 615,000</td>
<td>Huawei Technologies Co. Ltd.</td>
</tr>
<tr>
<td>Smart Fetal Monitoring Belt</td>
<td>Prof. YOU Jia Jane</td>
<td>HK$ 3,256,500</td>
<td>Innovation Technology Fund (ITF)-HKRITA</td>
</tr>
<tr>
<td>Cantonese Speech-to-Text as Turnkey technology for Dyslexic Children</td>
<td>Prof. LU Qin</td>
<td>HK$ 1,400,000</td>
<td>Innovation Technology Fund (ITF)-ITSP-Tier 3</td>
</tr>
<tr>
<td>Automated Watchlist Identification System for Enhanced Security at Border Crossings</td>
<td>Dr PATHAK Ajay Kumar</td>
<td>HK$ 998,800</td>
<td>Innovation Technology Fund (ITF)-ITSP-Tier 3</td>
</tr>
<tr>
<td>The Encoding of Chinese Variants and Specification for Font Production in Hong Kong</td>
<td>Prof. LU Qin</td>
<td>HK$ 1,249,120</td>
<td>Innovation Technology Fund (ITF)-ITSP-Tier 3</td>
</tr>
<tr>
<td>Assessing the Vulnerabilities of Online Services to Advanced DDoS Attacks</td>
<td>Dr LUO Xiapu Daniel</td>
<td>HK$ 4,356,200</td>
<td>Innovation Technology Fund (ITF)-UICP-MGJR</td>
</tr>
<tr>
<td>Cloud-to-Cloud Data Communications and Management</td>
<td>Dr CHAN Chun Bun Henry</td>
<td>HK$ 2,030,900</td>
<td>Innovation Technology Fund (ITF)-UICP-MGJR</td>
</tr>
<tr>
<td>An eLearning Application using Automated Ontology Management</td>
<td>Dr CHAN Chun Chung Keith</td>
<td>HK$ 4,999,924</td>
<td>Innovation Technology Fund (ITF)-UICP-MGJR</td>
</tr>
<tr>
<td>Dynamic and Intelligent Channel Allocation Methods for Multi-radio Wireless Mesh Network</td>
<td>Dr CHAN Chun Bun Henry</td>
<td>HK$ 361,800</td>
<td>Innovation Technology Fund (ITF)-UICP-TCS</td>
</tr>
<tr>
<td>Adaptive Data Management for Cloud-based Wireless Mesh Networks</td>
<td>Dr CHAN Chun Bun Henry</td>
<td>HK$ 361,800</td>
<td>Innovation Technology Fund (ITF)-UICP-TCS</td>
</tr>
<tr>
<td>Detecting and Evaluating Opinion Influencers in Online Social Media</td>
<td>Dr CHUNG Fu Lai Korris</td>
<td>HK$ 366,200</td>
<td>Innovation Technology Fund (ITF)-UICP-TCS</td>
</tr>
<tr>
<td>Highlight of Projects Secured Internal Research Grant (2015 - 2016)</td>
<td>Project Leader</td>
<td>Amount</td>
<td>Funding Scheme</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------------------------------------------------------</td>
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<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Interactive Visual Analytics on Streaming Data</td>
<td>Prof. BACIU George</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>An Adaptive, User-centered, Multi-Modal Approach to Identification of Human Affects in Spontaneous, Real-Use Conditions</td>
<td>Dr NGAI Grace</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>Stealthy Mobile Botnet and its Defense in the LTE Era</td>
<td>Dr LUO Xiapu Daniel</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>A General Framework for Computer-Aided Personalized Pathological Analysis by Adaptive Hybrid Fusion of Medical Big data</td>
<td>Prof. YOU Jia Jane</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>To Trust or Not to Trust: Interaction-driven Information Credibility Modeling on Social Media Network</td>
<td>Dr LI Wenjie Maggie</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>On Accurate Recovery of 3D Information from Biometrics Images using Photometric Stereo</td>
<td>Dr PATHAK Ajay Kumar</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>Accountable Anonymity - Towards Achieving Security and Privacy without Trusted Entities</td>
<td>Dr AU Man Ho Allen</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>Mobile Data Collection and Processing to Alleviate Crowdedness by Crowdsourcing to Smartphones</td>
<td>Dr XIAO Bin</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>When Downclocking Meets Cross Correlation: Eliminating Energy Inefficiency of the Packet Overhearing Problem in Wireless Networks</td>
<td>Dr LOU Wei</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>A Knowledge-based Approach to Emotion Analysis for Chinese Text</td>
<td>Prof. LU Qin</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>Remote Data Transmission and on Board Assessment of HSR</td>
<td>Dr WANG Dan</td>
<td>HK$ 500,000</td>
<td>Projects of CNERC</td>
</tr>
<tr>
<td>Advanced Wireless Communication Technology for Integrated Monitoring of High Speed Railways</td>
<td>Prof. CAO Jiannong</td>
<td>HK$ 500,000</td>
<td>Projects of CNERC</td>
</tr>
<tr>
<td>Cross-disciplinary Big Data Processing and Analytics</td>
<td>Prof. CAO Jiannong</td>
<td>HK$3,025,000</td>
<td>Project of Strategic Importance</td>
</tr>
<tr>
<td>Mobile Intercloud System - Preliminary Study</td>
<td>Dr CHAN Chun Bun Henry</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>A Data Adaptive Framework for Accurate Image Restoration</td>
<td>Prof. ZHANG Lei</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>A Multi-modal Approach to Identifying Human Emotional and Cognitive Affects in Spontaneous, Real-use Conditions</td>
<td>Dr NGAI Grace</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>A Multi-modal Approach to Identifying Human Emotional and Cognitive Affects in Spontaneous, Real-use Conditions</td>
<td>Dr NGAI Grace</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>A Framework and Performance Optimization for Big Data Processing in the Cloud</td>
<td>Dr WANG Dan</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>A New Path to Multimedia Content Analysis</td>
<td>Dr LIU Yan Fiona</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
<tr>
<td>New Approaches to Event Data Collection and Processing by Crowdsourcing to Smartphones</td>
<td>Dr XIAO Bin</td>
<td>HK$ 150,000</td>
<td>Fundable General Research Fund (GRF)</td>
</tr>
</tbody>
</table>
Interdisciplinary Education

We are committed to nurturing professionals who will serve society through the application of advanced knowledge and skills in computing-related disciplines.

The CARE Philosophy

Our educational approach is summarised by the acronym CARE, standing for a focus on Career, Application, Research and Entrepreneurship.

The career pillar ensures that our students develop broad knowledge and skills through internships, overseas study, exchange programmes and Work-Integrated Education. The application pillar provides application-oriented computing courses covering fields such as business, finance, and healthcare.

The research pillar keeps students abreast of the latest advancements, and the entrepreneurship pillar encourages them to develop innovative ideas in this rapidly changing world.

Distinctive Programmes

Our PhD, EngD, MPhil, Taught Master, Executive Master and undergraduate programmes all integrate principles, systems and applications. Initiatives such as the Challengers Programme also sharpen students’ leadership, entrepreneurship and research skills.
Broad Discipline of Computing

Unique in Hong Kong, the Department offers its own Broad Discipline of Computing that includes three programmes with diversified scopes of curriculum design for students to choose after their common first year of study. Specific niches have been introduced in each programme, which empowers students with the competitive edge they will need on their career paths.

Bachelor of Science (Honours) in Computing

The BSc (Hons) in Computing emphasizes on applying computing theories and programming methodologies to design and develop fast and smart computing systems and software. The programme equips students with solid foundations of computer science for solving practical problems and developing software for high performance and intelligent computing systems.

The representative subjects include:
- Human-Computer Interaction
- Artificial Intelligence
- Data Mining and Data Warehousing
- Big Data Analytics
- Software Design Principles
- Computer Graphics
- Information Retrieval

Graduates are equipped to become analyst programmers, system analysts, software engineers, database administrators or software architects in both public and private sectors.

Bachelor of Science (Honours) in Information Technology

The BSc (Hons) in Information Technology programme is oriented towards integrating computing devices, systems and software to design and implement IT architectures for advanced applications. The programme trains students to think creatively and systematically. They gain knowledge in hardware and software engineering principles as well as system modelling, which allows them to develop integrated technologies for IT applications.

The representative subjects include:
- Internet Security
- Mobile Computing
- Game Design and Development
- E-Commerce Technology
- Embedded Software
- Social and Collaborative Computing
- Service and Cloud Computing

Graduates are equipped to become game and mobile apps designer, information technology security specialists and information technology architects.

Bachelor of Science (Honours) in Enterprise Information Systems

The BSc (Hons) in Enterprise Information Systems programme focuses on applying computing technologies and enterprise information to develop and manage business solutions. The programme emphasises on e-business and information systems strategies, their applications, as well as design and development skills.

The representative subjects include:
- E-Business
- Business and Information Systems Strategies
- Software Project Management
- IT Entrepreneurship
- Information Systems Audit and Control
- Business Intelligence and Customer Relationship Management
- Computational Finance

Graduates are equipped to become management executives, business analysts, system developers, project managers and information system managers.
Bachelor of Science (Honours) in Information Security

The BSc (Hons) in Information Security programme is a full-time government-funded top-up degree programme delivering a wide range of professional knowledge and skills relevant to information security including how to protect data security and privacy, and to safeguard against the risk of potentially devastating security attacks and misuses.

The major subject areas include:

- Access Control
- Cryptography
- Software Development Security
- Operations Security
- Telecommunications and Network Security
- Security Architecture and Design
Challengers Programme  
– Talent of Tomorrow

Entrepreneurs of Tomorrow Club

Programming Guru's Club

Undergraduate Researchers’ Club

Study Tours, Competitions, Career Forums

Outside the regular curriculum, students are challenged through initiatives such as the voluntary Challengers Programme (CHAMP), which enhances their creativity, innovation, leadership and soft skills through a set of problem-solving and project-based activities that require teamwork and cross-discipline collaboration.

When entering CHAMP, students chose to join one of three clubs: the Entrepreneurs of Tomorrow Club, Programming Gurus’ Club or Undergraduate Researchers’ Club.

The Entrepreneurs of Tomorrow Club provides students with experience in entrepreneurship, built on the aim of cultivating an entrepreneurial spirit that will stay with them for life. The Programming Gurus’ Club trains experts in computer programming through novel courses, competitions and overseas tours, all the while enhancing their technical competence. The Undergraduate Researchers’ Club grooms young researchers with practical experience, arousing their enthusiasm for scientific research and development.

Through devoted effort, innovative thinking and pragmatic outlooks, our CHAMP students discover an entirely different aspect of university life.
Service Learning

The Department places a heavy emphasis on social commitment and responsibility, ensuring that all students apply classroom knowledge to help people in need. We were the first department at PolyU to practice this form of service learning, whereby students take part in projects that benefit disadvantaged groups, aid the work of non-governmental organisations and contribute to government initiatives that are designed to address social problems.

As part of a PolyU-wide initiative, service learning is now credit-bearing and compulsory. Our students take part in projects organised in Hong Kong, mainland China and other parts of the world, such as Cambodia, Rwanda and Myanmar. Not only do they get to help people in need, which can be deeply rewarding for them as well as the recipients, but they also develop their sense of belonging to the local and even global community.

The service work is heavily information technology-related, allowing our students to excel at transforming classroom learning into real-world, lasting solutions. To offer just a few examples, they have provided a library management system for a primary school, designed anti-drug multimedia learning resources for students, teachers and parents, and used information technology to foster communication and friendship with refugees.
Global Outlooks

Central to our efforts in promoting all-rounded student development are the opportunities we provide to develop global outlooks. Not only do our students broaden their perspectives through exchange programmes, study tours and overseas internships, but they also connect with the global computing and information technology sectors. The knowledge and skills they acquire and the experience they gain prepare them to be leaders in their communities and careers.

Exchange Experiences

Our students spend between two and six months at universities such as the prestigious ETH (Swiss Federal Institute of Technology Zurich) in Switzerland, KAIST (Korea Advanced Institute of Science and Technology) in Korea, the Georgia Institute of Technology in the USA, the National University of Singapore, the National Taiwan University of Science and Technology and other universities in Sweden, the United Kingdom and North America.

The snapshots here show our students immersed in their exchange experiences, taking in the best that the world has to offer!

Study Tours

Our students participate in study tours to a broad range of destinations, such as Cambridge in the UK, Singapore, and Beijing, Tianjin and Xinjiang in mainland China. At each destination they have the opportunity to learn, develop skills and showcase their maturing talents.

International Work Experience

Our students undertake internships in countries such as Denmark, Switzerland, Germany, the USA and France, broadening their understanding about how the computing and information technology sectors operate. The cross-cultural understanding they develop is critical to their future careers and personal appreciation of this globalised era.
“Programmes of the Department of Computing are interesting and interactive, and practically train up my programming and problem-solving skills. Furthermore, the teaching staff are patient and they nurture my interest in programming.”

~ Mr LAU Shiu, Fung, graduate of BSc in Computing and current student of MPhil in Computing

“The most important thing in our lives is never give up easily. We all face difficulties in our lives. Even though we are in big trouble, just keep on concentrating and achievement will be the fruition of our hard work. This is what I have learnt through my studies in the Department.”

~ Miss CHAN Iris, current student of BSc in Enterprise Information System

“The programmes of the Department of Computing not only focus on computer studies but also include some aspects of business which can help me develop my career. I am well-trained for problem-solving in my studies. It helps me a lot in understanding and executing duties in my future works.”

~ Mr KWAN Anson, current student of BSc in Information Technology

Department of Computing at PolyU not only offers courses with basic grounding in computation but also provides various opportunities for students’ professional development, such as Programming Contests, Hackathon, research work, one-year internship, etc. If you plan your career path earlier then you can choose the related activities accordingly. I can fulfill my potential and become whatever person I want to be here.”

~ Mr LI Chi, current student of double degree programme, BSc in Computing and BBA in Management
The Department attracts research postgraduate students from Hong Kong and around the world, setting the scene for a rich mix of intellectual stimulation and crosscultural engagement in various areas of computing and information technology. Over 90 research students are currently studying towards either MPhil or PhD degrees, dedicating themselves to exploring the frontiers of:

- Human language technology and knowledge discovery, with a focus on information processing related to the Chinese language and Cantonese speech processing
- Graphics, multimedia and virtual reality, focusing on 3D computer graphic modelling, rendering, animation and multimedia applications
- Mobile and network computing, with emphases on the design and analysis of architectures, protocols and distributed algorithms for network communications and computing, and wireless networking for a ubiquitous computing environment
- Pattern recognition and machine intelligence, encompassing biometrics, computer vision, pattern analysis, machine learning, image processing and medical diagnoses image analysis

Our students’ cutting-edge research is supported by enthusiastic faculty members and support staff who ensure that the Department provides them with a positive and nurturing academic environment.

The Department also ensures that all research students have opportunities to enrich their research experiences through research exchange visits, attendance at leading international conferences and participation in global competitions and departmental projects. Their work, often conducted in conjunction with Faculty members, is presented at our Annual Research Open Day, which attracts interest from various external parties and potential partners.

A further benefit is the Department’s global network across disciplines and bridges industries, offering our students ample career opportunities, resources and access to research funding.

Full-time students are eligible for Research Studentships. Those with exceptional portfolios can apply for scholarships offered under the Hong Kong PhD Fellowship Scheme. International students also have the opportunity to apply for The Hong Kong Polytechnic University International Postgraduate Scholarships as well.
COMP Annual Research Day (CARD)

CARD is one of our major events every year, providing a professional but friendly atmosphere for discussion among our research students as well as an excellent opportunity for the students to present their work to their peers and faculty members, and to learn more about the exciting research that is being conducted by other students in the Department.

Each research student gives a presentation on a current research topic, application prospect of a technology or other interesting topics which is not limited to a published work. All the presentations are judged by faculty members for the Best Presentation Awards. Students are also invited to cast votes for the Most Inspiring Awards.
Taught Postgraduate Programmes

Our taught postgraduate programmes provide education in computing and information technology that is tailored to the needs of students from diverse backgrounds. Students benefit not only from detailed knowledge of fundamental theories, core and applied technologies and industry best practices, but also from interaction with their peers in exchanging ideas and discussing experiences. They acquire both advanced expertise and professional networks that help them to scale new heights in their careers.

Engineering Doctorate

The Engineering Doctorate (EngD) is a professional doctorate degree designed to meet the needs of engineers who are already in senior management and policy-making positions, or whose career progression will take them into industrial R&D management position in the near future. It offers students an opportunity to broaden and deepen their knowledge by pursuing a qualification of direct relevance to their engineering profession at the doctorate degree level. An important feature of the EngD degree is the substantial amount of taught coursework which is designed to provide graduates with the broad knowledge and research skills needed for a successful engineering management or R&D career.
<table>
<thead>
<tr>
<th>Programme</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master of Science in Information Systems</td>
<td>The MSc in Information Systems provides management and other business professionals with knowledge, skills and confidence in the application of information systems within industry and business. It is designed for professionals with arts, business and social science backgrounds who need to design, apply and evaluate information systems in today's business environment. Students explore and understand databases and data mining, intelligent information systems, workflow and collaborative systems, human-computer interaction and information system project management. They develop the ability to understand, appraise, plan and re-engineer information systems, positioning them for employment or advancement as information systems executives and managers, information systems project coordinators and systems analysts.</td>
</tr>
<tr>
<td>Master of Science in Information Technology</td>
<td>The MSc in Information Technology is a bridging programme for professionals from science and engineering backgrounds who do not have extensive computing experience. It is designed for those who want to acquire information technology knowledge and apply it in their jobs, ensuring career development. Students have opportunities to explore and understand mobile technology, software engineering for high-quality software, Internet infrastructure, artificial intelligence and other elements of information technology. With high levels of competence in applying information technology to solve scientific, engineering and business problems, graduates are suited for employment as IT managers, IT consultants, IT project offices and IT-related engineers.</td>
</tr>
<tr>
<td>Master of Science in Software Technology</td>
<td>The MSc in Software Technology is designed for professionals who want to advance their knowledge in computing and software technology for continuous development in computing-related careers. Students normally have computer science, software engineering or other computing-related backgrounds. They acquire up to date, in-depth knowledge in software technology, gaining opportunities to specialise in areas such as software project management, software testing and quality assurance, embedded software, distributed computing and pervasive computing, among others. Combined with independent study and research into advanced computing, this equips them for employment as senior software engineers, computer scientists, information managers and network security managers.</td>
</tr>
<tr>
<td>Master of Science in E-Commerce</td>
<td>The MSc in E-Commerce is designed for professionals from all backgrounds who want to develop business and technical skills in e-commerce. Students are equipped with fundamental concepts, gaining a sound knowledge of e-business models, information systems, Internet, Web and intelligent technologies, legal issues and management strategies in e-commerce. They are also provided with opportunities to analyse, design and implement e-commerce systems. With the ability to understand and appraise e-commerce opportunities, systems and tools, graduates are aware of their potential and limitations. They can take on challenges as e-commerce consultants, business managers, project coordinators and e-commerce entrepreneurs.</td>
</tr>
<tr>
<td>Executive Master in Digital Leadership</td>
<td>Executive Master in Digital Leadership is specially designed to provide tech savvy executives, engineers, scientists, IT professionals and hitech investors with genuinely innovative professional development experience to assume digital leadership in the competitive hitech business environment. Digital technologies, which include mobile devices, social media platforms, cloud, big data and analytics, are giving birth to disruptive, high-growth organizations. These companies are rewriting the rules in well-established industry sectors, which are creating a demand for new kinds of leaders who are comfortable with emerging technologies and business models. This programme addresses such a need, with global and local exposure to thrive in Digital Leadership.</td>
</tr>
</tbody>
</table>
### Teaching Recognitions

**Highlight of Teaching Award**

<table>
<thead>
<tr>
<th>Awardee</th>
<th>Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr CHAN Chun Bun Henry</td>
<td>2015 Computer Science and Engineering Undergraduate Teaching Award of the IEEE Computer</td>
</tr>
</tbody>
</table>

**On-going Learning & Teaching Project Grant**

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Leader</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>VizMove Virtual Reality (VR) System: Working VR Combined with Projection VR</td>
<td>Dr CHUNG Fu Lai Korris</td>
<td>HK$1,066,200</td>
</tr>
<tr>
<td>The Development of Mobile APPS for SHTM Students’ Assessment of Tourist Attractions</td>
<td>Dr FUNG Sui Leung Walter</td>
<td>HK$120,000</td>
</tr>
<tr>
<td>Institution-wide Evaluation and Enhancement of Credit-bearing Service Learning Subjects</td>
<td>Dr CHAN Chi Fai Stephen</td>
<td>HK$1,620,000</td>
</tr>
<tr>
<td>Fostering Student Learning Engagement in Interactive Classes with Peer Grading</td>
<td>Dr NG To Yee Vincent</td>
<td>HK$147,500</td>
</tr>
<tr>
<td>Learning Analytics and Educational Data Mining: Making Sense of Big Data in Education</td>
<td>Prof. CAO Jiannong</td>
<td>HK$972,000</td>
</tr>
</tbody>
</table>

### Student Awards

**Research Award**

<table>
<thead>
<tr>
<th>Research Award</th>
<th>Organization</th>
<th>Project</th>
<th>Awardee</th>
<th>Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best Student Paper Award</td>
<td>The IAENG International Conference on Communication Systems and Applications (2015)</td>
<td>A Cloud-based Wireless Mesh Network with Adaptive Data Storage Functions</td>
<td>YANG Shengtao</td>
<td>Dr CHAN Chun Bun Henry</td>
</tr>
<tr>
<td>Best Student Paper Award</td>
<td>The IAENG International Conference on Computer Science (2014)</td>
<td>RFID-based Location Tracking System Using a Peer-to-Peer Network Architecture</td>
<td>HUI Chun Pan</td>
<td></td>
</tr>
<tr>
<td>Competition Award</td>
<td>Organization/ Competition</td>
<td>Awardee</td>
<td>Supervisor</td>
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<td>-------------------------------------------------------</td>
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<tr>
<td>Champion Award - &quot;Games&quot; Category</td>
<td>Microsoft Imagine Cup 2016 - Hong Kong Final, organized by Microsoft Hong Kong and co-organized by the Hong Kong Science and Technology Parks Corporation</td>
<td>SIN Ping Tat, HO Man Fai, LAU Shiu Fung</td>
<td>Dr CHAN Chun Bun Henry and Dr NG Hiu Fung Peter</td>
<td></td>
</tr>
<tr>
<td>Champion Award - &quot;Innovation&quot; Category</td>
<td></td>
<td>SIN Ping Tat, HO Man Fai, LAU Shiu Fung</td>
<td>Dr CHAN Chun Bun Henry</td>
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<tr>
<td>Champion Award - &quot;World Citizenship&quot; Category</td>
<td></td>
<td>SIN Ping Tat, HO Man Fai, LAU Shiu Fung</td>
<td>Dr CHAN Chun Bun Henry</td>
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<tr>
<td>Best Digital Inclusion Award</td>
<td>Hong Kong ICT Awards (2015)</td>
<td>HO Man Fai, LAU Shiu Fung, SIN Ping Tat, YAU Chi Kuen</td>
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<tr>
<td>First Prize</td>
<td>IEEE Region 10 SAC Undergraduate and Postgraduate Paper Contest (UG Category) (2015)</td>
<td>HO Yik Him</td>
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<tr>
<td>Gold Award &amp; Best Innovation Award</td>
<td>Pan-Pearl River Delta Region Universities IT Project Competition (2015)</td>
<td>HO Man Fai, SIN Ping Tat, YAU Chi Kuen, YU Chin Ting</td>
<td>Dr CHAN Chun Bun Henry</td>
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<td>World Summit Youth Award</td>
<td>World Summit Youth Award in the category of “Fight Poverty, Hunger &amp; Disease” (2014)</td>
<td>LIU Xi, SUN Ruoqing, ZHU Jiachen</td>
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<tr>
<td>Silver Award</td>
<td>Pan-Pearl River Delta Region Universities IT Project Competition (2014)</td>
<td>LIU Xi, SUN Ruoqing, ZHU Jiachen</td>
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<tr>
<td>First Class Award</td>
<td>Asia Student Supercomputer Challenge (2014)</td>
<td>CHAN Ka Wai, LAU Tsz Wai, WONG Tsz Wun, YEUNG Ka Chun, YU Chi Keung</td>
<td>Dr NG To Yee Vincent</td>
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<tr>
<td>Most Potential Application Award</td>
<td>Hong Kong-Taiwan Internet of Things (IoT) Academia Awards (2014)</td>
<td>HO Man Fai, LAU Shiu Fung, SIN Ping Tat, YAU Chi Kuen, YU Chin Ting</td>
<td>Dr CHAN Chun Bun Henry</td>
<td></td>
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<tr>
<td>Gold Award – IoT Revolution Application</td>
<td>Hong Kong U-21 Internet of Things (IoT) Awards (2014)</td>
<td>HO Man Fai, LAU Shiu Fung, SIN Ping Tat, YAU Chi Kuen, YU Chin Ting</td>
<td>Dr CHAN Chun Bun Henry</td>
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<tr>
<td>Gold Award</td>
<td>KINECT Application Development Contest (2014)</td>
<td>MA Cheuk Fung, O King Chun, YIP Hiu Fai</td>
<td>Dr NG Hiu Fung Peter</td>
<td></td>
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<tr>
<td>Best Student Invention Award</td>
<td>Hong Kong ICT Awards (2014)</td>
<td>LAU Shiu Fung</td>
<td>Dr CHAN Chun Bun Henry</td>
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</table>
Shining Alumni

With its focus on interdisciplinary research and education, the Department nurtures talents who develop highly successful careers in a broad range of fields. From senior industry executives to young entrepreneurs and competent professionals, our alumni shine in any number of roles.

Mr CHOW Chok Kee Horace

Mr Chow has 20 years of experience running multinational IT companies in Hong Kong. Since completing his Diploma in Computing Studies at the Department of Computing in 1985, he has played senior management roles in several large IT corporations, shaping policy development, transforming enterprises with the latest technology, growing the local partner ecosystem and developing IT professionals and management talent.

Currently, Mr Chow is the General Manager of Microsoft Hong Kong and Macau. On the community services front, he has served on the advisory committees of various IT Management and Systems Engineering and Engineering Management departments, as well as government committees. He also regularly visits Hong Kong universities to offer students insights into the social impact of technological innovations.

Mr LAM Bing Kuen Paul

Mr Lam gained his MSc in E-Commerce from the Department of Computing in 2003, after which he served as president of the Computing Alumni Association (2004-2006) and as a member of the Departmental Advisory Committee (2006-2008).

Mr Lam has been responsible for application development, IT infrastructure and operations at various multinational companies. In 2006 he initiated the Amway Pan-Pearl River Delta Region Universities IT Project Competition. He has also conducted research at the University of Strathclyde in England on the relationship between IT operating costs and commercial applications of technology, and intelligent business applications.

A Fellow of the Hong Kong Computer Society, Mr Lam has served on its International/China Affairs Committee and facilitated many exchanges between Hong Kong and mainland China.

Ir Dr LEUNG Ping Hung Karl Richard

Ir Dr Leung received his Diploma and Higher Diploma in Computing Studies from the Department of Computing in 1985 and 1987 respectively, after which he was a faculty member from 1989 to 1998. He then joined the Vocational Training Council.

As one of three project managers at the University of Hong Kong in 1989, Ir Dr Leung developed all software for the Computer Literacy subject in local secondary schools. He has also lobbied the local and central governments to include IT as a functional constituency in the Legislative Council and to establish the Innovation Technology Fund.

Ir Dr Leung’s results have been adopted by organisations such as Yantian International Container Terminals, and his research is frequently attracts media attention.
Mr Lee graduated from BSc in Computing from the Department of Computing at PolyU in 1998, while Dr Chuang graduated from BSc in Information Technology in 1999, MPhil in 2002 and PhD in Computer Science in 2009 from the Department of Computing at PolyU.

Mr Lee and Dr Chuang are the co-founders of K-Matrix Group. They are an excellent example of successful partnership in which Mr Lee is the CEO who takes care of the business side; while Dr Chuang is the CRD (Chief Research Director) who is in charge of the research and development of the company’s technology backbone. K-Matrix was founded from the incubation programme of Hong Kong Science Park back in 2005 when they started to develop a series of cutting-edge analytics tools and systems for sophisticated digital intelligence analysis. With headquarter in Hong Kong, the company has expanded their business to the Greater China with branches set up in Shanghai and Guangzhou. The company has been partnering with over 400 companies including charity, government and non-government organization in advertising, corporate communication, marketing and communication, media planning and public relation sectors in China and Hong Kong. Currently, they are planning to expand their business to Asia-Pacific region.

Dr Lin graduated from BA in Computing in 2000, MPhil in 2002 and PhD in Computer Science in 2005 from the Department of Computing at PolyU, while Dr Wong graduated from BA in Computing in 2006 and PhD in Computer Science in 2010 from the Department of Computing at PolyU.

Dr Lin and Dr Wong are the co-founders of HerbMiners Informatics Limited. Dr Lin is the CRO (Chief Research Officer) who is in charge of the research section and Dr Wong is the CIO (Chief Information Officer) who is responsible for business and product development. The clinical management system of the company has been widely deployed in Hong Kong, China, USA, UK and Canada. Their research interests include TCM (Traditional Chinese Medicine) data mining and big data analytics in healthcare domain. They filed two patents, one is related to artificial intelligence technique while another one is for TCM ontology. The company has been partnering with various renowned research parties all over the world including PuraPharm Corporation Limited (Stock code: 1498), IBM, University of Toronto, King’s College London, University of Sydney, University of Western Sydney, HKU, CUHK and HKBU. The company is now working with Guangxi Government of China for the advancement of big data healthcare analytics platform.
The Department is active in seeking collaboration with industry and other institutes to provide a unique and advanced environment in which to achieve excellence in research and education. We work closely with industry partners on the development of advanced technologies and their commercial and industrial application, and have established numerous joint laboratories to serve both research and educational purposes.

The following five joint laboratories serve as examples of our fruitful efforts to connect with industry and other parts of academia to produce ground-breaking results.
PolyU-Microsoft Smart Computing Laboratory

Smart computing is emerging as an important multidisciplinary area with the capacity to touch all aspects of life. The PolyU-Microsoft Smart Computing Laboratory was established at the Department to support applied research, teaching and learning related to smart computing with the intention of fostering the research and development of next-generation smart applications. Another important task is to deliver Work-Integrated Education workshops that provide students with the opportunity to master the knowledge base and skillsets needed to benefit from the latest smart computing trends.

With sponsorship of up to HK$10 million over three years, Microsoft has provided software, cloud services, consultancy and internship places that are allowing the Department to advance knowledge and learning in aspects of smart computing related to cloud computing, big data, human centred computing and mobile computing. In the joint laboratory, students also have a fertile environment in which they can engage with smart applications and devices in real-life usage scenarios.
Joint IBM/PolyU Enterprise Data Analytics Laboratory

The Joint IBM/PolyU Enterprise Data Analytics Laboratory (EDAL) is one of the major laboratories in the Department. EDAL focuses on the big data research on design of software tools, and analytical algorithms for enterprise and social media data. Based on the advance big data analytic tools and platform, EDAL is empowered to provide a 360-degree support for student learning on data analysis and generating data products. There are 3 objectives of EDAL covering teaching and learning, research and professional knowledge transfer. The Lab plays a key role in assisting the curriculum development of data science and big data analytics in the Department. For the research aspect, EDAL aims to provide a platform to advance big data technologies. Our initial focuses are on the applications and fundamentals of analysis of big data in enterprises, social media, and education. The laboratory also supports knowledge transfer to the communities and enterprises. We aim to actively seek collaboration with different partners for training, consultancy and big data analysis support.
PolyU-Yonyou Joint Laboratory on Smart Cloud Computing

The establishment of the joint lab combines the strengths of the Department and Yonyou Software Co. Ltd (Yonyou) to develop new management methodologies and bring about more innovative services which benefit industries and businesses. This is the first time ever in Hong Kong that Yonyou joins hands with local tertiary institute to establish a new infrastructure supporting research and education. The lab provides a platform for conducting research in enterprise smart computing and business applications, as well as for developing young talents with advance knowledge and skillsets in enterprise management software.
PolyU Branch of Ministry of Education Key Laboratory of Machine Intelligence and Advanced Computing

The PolyU Branch of Ministry of Education Key Laboratory of Machine Intelligence and Advanced Computing is jointly established by The Hong Kong Polytechnic University (PolyU) and Sun Yat-sen University (SYSU) in March 2014. The establishment of the branch laboratory serves as a recognition of our distinctive success in undertaking world-class research and delivering high-quality education over the past 40 years. Through fostering strategic research collaborations between the Department and SYSU on recent development in big data analytics and cognitive computing and facilitating the development of talents, the Key Laboratory will further enhance its impact in the international arena. Also, capitalising the research strengths of PolyU and SYSU, the laboratory will be instrumental to advancing the technology frontier for the benefits of the nation’s development.
Advanced Enterprise Infrastructure Laboratory/
PolyU-SYSU Networked Lab on Creative Applications

The networked lab is built on the partnership of two existing labs, namely the Advanced Enterprise Infrastructure Laboratory (sponsored by Cisco and Macroview Telecom) at the Department and the Digital Media Technology Laboratory at the School of Software, Sun Yat-sen University (SYSU). It aims to foster collaborations among students and researchers between the Department and SYSU.
Outstanding Community Services

We have put great efforts into maintaining strong bonds with the community and enhancing the sustainable development of the information technology industry. We are enthusiastic about contributing to the society by applying our knowledge and expertise through a diverse range of activities. Our partnerships with business and industry as well as social services enable us to maintain close relationship with professionals and the community.

Social Services

Our faculty members are devoted to the society through various of services, serving as executive and board members of various NGOs and educational organizations, and consultants to industries and government organizations, we transfer computing knowledge that benefits the industry and the society. We provide IT training to local schools, and are actively involved in community initiatives such as anti-drug and Basic Law literacy drives, etc.

Professional Recognitions and Services

We have a long history of offering professional services to local and overseas communities. Our faculty members serve on the editorial boards of several top international journals and we frequently host international conferences for knowledge transfer and networking. The following are some examples of our professional service engagements:

• Chair of the IEEE Hong Kong Section
• Member of Hong Kong RGC and ITF Panels
• Chairman of Information Technology Division of HKIE
• Chair or Co-chair of organizing committee of international symposium and conferences
• Member of Advisory Committee of Digital Inclusion Mobile Applications, OGCIO, Hong Kong
• Member of the Hong Kong Examinations and Assessment Authority Council
• Member of Certification Board of the HKITPC
Staff Achievements

Highly Cited Researchers 2014 & 2015 (Engineering Category), Thomson Reuters
Awardee: Prof. ZHANG Dapeng David

Highly Cited Researchers 2015 (Engineering Category), Thomson Reuters
Awardee: Prof. ZHANG Lei

The President’s Award for Excellent Performance/Achievement in Services 2012/13, PolyU
Awardee: Prof. LU Qin

The President’s Award for Excellent Performance/Achievement in Services 2010/11, PolyU
Awardee: Dr CHAN Chun Bun Henry

The President’s Award for Excellent Performance/Achievement in Teaching 2010/11, PolyU
Awardee: Dr NG To Yee Vincent

The President’s Award for Excellent Performance/Achievement in Research and Scholarly Activities 2008/09, PolyU
Awardee: Prof. CAO Jiannong

The President’s Award for Excellent Performance/Achievement in Teaching 2009/10, PolyU
Awardee: Dr NGAI Grace

The President’s Award for Excellent Performance/Achievement in Services 2008/09, PolyU
Awardee: Dr CHAN Chun Bun Henry

Medal of Honour (M.H.) 2012, HKSAR Government
Awardee: Prof. LU Qin

The President’s Award for Excellent Performance/Achievement in Teaching 2007/08, PolyU
Awardees: Dr CHAN Chi Fai Stephen, Dr CHAN Chun Bun Henry, Dr CHUNG Fu Lai Korris, Dr LEONG Hong-va, Dr NG To Yee Vincent, Dr NGAI Grace, Dr SHIU Chi Keung Simon
Departmental Advisors

The Department has assembled a consortium of advisors who are prominent leaders in their professions, making significant contributions to facilitate the Department’s endeavours in teaching, research and professional services to the industry and the society.

DEPARTMENTAL ACADEMIC ADVISOR (DAA)
Prof. BHAGAVATULA Vijayakumar
Associate Dean for Graduate and Faculty Affairs of the College of Engineering and the U.A. and Helen Whitaker Professor of the Department of Electrical and Computer Engineering, Carnegie Mellon University, USA.

DEPARTMENTAL ADVISORY COMMITTEE (DAC)
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Mr CHOW Chok Kee Horace
General Manager
Microsoft Hong Kong Limited

Vice-Chairman
Prof. SURI Neeraj
TUD Chair Professor
Department of Computer Science
TU Darmstadt
Darmstadt, Germany

Members
Mr CHENG Rocky
Vice President (Local & Cross-border Collaboration)
Hong Kong Computer Society

Prof. GUO Minyi
Zhiyuan Chair Professor
Head of Department of Computer Science and Engineering
Director of Embedded and Pervasive Computing Center
Shanghai Jiao Tong University

Mr LAM Y.F. James
Principal
Lions College
Chairman
Hong Kong Subsidised Secondary Schools Council

Mr LEUNG K.M. Michael
President
Hong Kong Computer Society
Chief Information and Operations Officer
China CITIC Bank International

Ir Dr LEUNG R.P.H. Karl
Head
Department of Information Technology
Hong Kong Institute of Vocational Education (Chai Wan)

Prof. LU Jian
Vice President
Deputy Director of Computer Science and Technology Department
Nanjing University

Prof. MUTKA Matt W.
Professor and Chairperson
Department of Computer Science and Engineering
Michigan State University

Prof. WU Jie
Associate Vice Provost for International Affairs
Chair and Laura H. Carnell Professor
Department of Computer and Information Sciences
College of Science and Technology
Temple University

Ex-officio Members
Prof. MAN H.C.
Dean
Faculty of Engineering
The Hong Kong Polytechnic University

Prof. CAO Jiannong
Chair Professor and Head
Department of Computing
The Hong Kong Polytechnic University

Dr SHAO Zili
Associate Professor and Associate Head
Department of Computing
The Hong Kong Polytechnic University

Prof. ZHANG Lei
Professor and Associate Head
Department of Computing
The Hong Kong Polytechnic University

Internal Members
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Associate Professor
Department of Computing
The Hong Kong Polytechnic University

Prof. MAN H.C.
Dean
Faculty of Engineering
The Hong Kong Polytechnic University

Prof. ZHANG Lei
Professor and Associate Head
Department of Computing
The Hong Kong Polytechnic University

Dr SHAO Zili
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SMART COMPUTING Drives Innovations