



# Computers and Society

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Our Profession, in Context



# Context

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- Information (Explosion) Age
- Characteristics of Modern Society
- Professional Bodies
- Laws and Ethics

# Our Epoch

- Information Age
- Digital Age (digital == information?!)
- Internet Age (narrower speaking)
- Some say:
  - Post IT-Bubble Burst Bloom
  - e-Epoch
  - i-Epoch
  - Virtual Era





# Our Field in Rapid Pace of Change

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- 1940s : The first computer was built
- 1956 : First hard-disk drive weighed a ton and stored five megabytes
- 1991 : Space shuttle had a 1MHz computer
- 2000 : Desktop computers have GHz CPU's
- 2010 : Pocket devices hold 1TB of data
- 2014 : **At this moment**, you are using pocket-sized powerful gadgets, taking photos and updating status!



# Discussion Questions

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- What devices/ services are now computerized?  
(that were not originally, of course)  
Think back 10, 20, 50 years ago
- Can people live without computers, just a day?
- So, what are our roles as computer scientists, engineers and professionals in this field?

# Latest Developments

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- Social Networking
  - Facebook
  - Twitter
- Video Sharing
  - Youtube
  - Youku
- Mobile Computing
  - Connectivity
  - Interactivity
  - Rich set of I/O
  - Apps
- Search Engine
  - Context-aware
  - Image search
  - Voice search
- Online shopping
  - Amazon, eBay
  - iTunes
- RFID/ NFC
  - Near Field Communication
  - Tags
- GPS
  - Geo-Positioning
  - Location-Based Service
- Advanced Digital Sensors
  - CCD/ CMOS Image Sensor
  - Accelerometer
  - Terahertz Imaging
- Speech Recognition

# More to Come

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- Cloud Computing and Virtualization
- Virtual Reality
- 3D Imaging, Display and Printing
- Data Mining
- Bio-Informatics
- Flexible Displays and Sensors
- Wearable Computers
- Near-field Intra-body Communication



# Opportunities and Future Applications



Image Source: <http://www.rfidjournal.com/article/articleprint/3868/-1/1/>



# Risks and New Loopholes

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- Octopus CEO (Prudence CHAN) Resigns Over Data Sale (The Wall Street Journal 4 Aug 2010)



If there is an integrity problem and lies are told, shouldn't (Chan) be held responsible and be sacked?"



# Technology Brings Convenience, Risk and Control

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- E.g. Ubiquitous Digital Cameras
  - Convenience in taking and sharing pictures and video clips
  - Copyright Infringement
  - Privacy Issues: Hacking and Spying
    - <http://video.today.msnbc.msn.com/today/50572646/#50572646>
  - Measures: banning the use of camera and recording equipment in cinemas, restrooms and changing rooms; turn off/unplug them!



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# Characteristics of Modern Society

- Globalization: Earth as a Village
- Tends to be borderless
  - Necessities: food, water, energy and natural resources
  - Tangibles assets: goods, money and investments
  - People: travellers and work-force
  - **Intangible assets: knowledge, education, information and technology**
  - **Values, views, cultures and opportunities**

# Characteristics of Modern Society

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- Urbanization with sophisticated infrastructure
- We are running on many systems with the aid of tons of computers and IT equipment



Image Source: [http://commons.wikimedia.org/wiki/File:Hong\\_Kong\\_Night\\_Skyline.jpg](http://commons.wikimedia.org/wiki/File:Hong_Kong_Night_Skyline.jpg)

# Planning Your Future Career

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- Are you planning to establish a career or business outside HK?
- Have you ever thought about different options?
- *“Knowing the world and known by the world: the real meaning of internationalization of higher education”, Prof Joseph SUNG, 2012-05-07, VC’s Blog*
  - [http://www.vco.cuhk.edu.hk/js\\_blog/index.php?option=com\\_jaggyblog&task=viewpost&id=43&lang=en-GB](http://www.vco.cuhk.edu.hk/js_blog/index.php?option=com_jaggyblog&task=viewpost&id=43&lang=en-GB)



# Modern Society

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- Connected, connected and connected
- Networked Society
- Transportation/People Movement (人流)
- Logistics/Material Flow (物流)
- Finance/Cash Flow (財流)
- Information Flow (資訊流)
- In addition to Water, Air, Energy and Pollutant Distribution



# Computers and Modern Society

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- Help making it a “better” world
  - Higher efficiency
  - More effective
  - Faster
  - Saving cost
  - Saving labour
  - Reducing error
  - Make things possible





# Issues and Themes

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## Issues:

- Unemployment
- Isolation
- Crime
- Loss of privacy
- Errors
- Pollution



# Issues and Themes (cont.)

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## Themes:

- Old problems in a new context:
  - crime, pornography, violent fiction
- Adapting to new technology:
  - thinking in a new way
- Varied sources of solutions to problems:
  - natural part of change and life

# Issues and Themes (cont.)

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## Themes (cont.):

- Global reach of net:
  - ease of communication with distant peoples
- Trade-offs and controversy:
  - increasing security means reducing convenience
- Different aspects between personal choices, business policies, and laws
  - e.g. the choices of Yahoo! and Google
  - ref: [http://en.wikipedia.org/wiki/Google\\_China](http://en.wikipedia.org/wiki/Google_China)



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# Professional Bodies

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- International (and American):

- IEEE ([www.ieee.org](http://www.ieee.org))
- ACM ([www.acm.org](http://www.acm.org))



- Britain

- BCS ([www.bcs.org](http://www.bcs.org))



- The Hong Kong Institution of Engineers

- HKIE IT Division (<http://it.hkie.org.hk>)

- Hong Kong Computer Society

- <http://www.hkcs.org.hk>

# The HKIE



THE HONG KONG INSTITUTION  
OF ENGINEERS  
香港工程師學會

- Vision:
  - \*\* *Sustained Excellence in the Engineering Profession* \*\*
- Mission:
  - To promote the advancement of engineering and to facilitate the exchange of knowledge and ideas.
  - To provide a broad range of services to members, to assist them in developing their careers and to play their full role in contributing to society.
  - To maintain a high standard of the profession, and to raise the standing and visibility of engineers.
- Core Values:
  - Sustainability, Professionalism, Integrity, Excellence, and Continuous Improvement



# The HKIE

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- Formerly The Engineering Society of Hong Kong, founded in 1947
- Incorporated under "The Hong Kong Institution of Engineers Ordinance" (香港工程師學會條例) in 1975
- Reciprocal recognition of professional qualifications with other countries
- HKIE accredited degrees are recognized by other countries too

# We are Accredited by the HKIE!

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- List of Programmes Accredited by the HKIE
  - Engineering:  
<http://www.hkie.org.hk/eng/html/qualNmembership/progaccredlist.asp>
  - Computer Science:  
<http://www.hkie.org.hk/eng/html/qualNmembership/CompSciProg.asp>
- 17 Engineering Professors Named Fellows of HKIE, CUHK Newsletter No. 409, 19.12.2012  
(<http://www.iso.cuhk.edu.hk/english/publications/newsletter/article.aspx?articleid=55317>)
- Look up yourselves:
  - [http://www.hkie.org.hk/docs/downloads/membership/forms/25382%20\(enquiryform\).doc](http://www.hkie.org.hk/docs/downloads/membership/forms/25382%20(enquiryform).doc)
  - What does it mean to YOU?





# As a HKIE Member...

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- Receive professional recognition
- Becoming a chartered Engineer
  - Wiki article on the title “Ir”  
(<http://en.wikipedia.org/wiki/Ing%C3%A9nieur>)
- Being an eligible voter in the functional constituency in HKSAR

# Invited Talk (Optional)

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- Topic: HKIE Membership
  - Speaker from the HKIE
  - Date: Mon 24 Feb 2014
  - Time: 4:30pm – 5:15pm
  - Venue: LSK LT5  
(Lee Shau Kee Bldg)

Attend if you are interested.



# Global IT Labour Market and Required Workforce Characteristics

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- Outsourcing
- Offshore outsourcing
- Team work
  - International/ global teaming
- Work under pressure
  - Shortening “time-to-market”
- Specialization
- Cross disciplinary knowledge
- Communication skill and EQ

# Career Path

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- What do you think?
- Our outstanding alumni's
  - Vice Chairman, Hong Kong Linux Industry Association
  - Research Staff Member, IBM T.J. Watson Research
  - Head of Distribution Governance, Consumer Banking at Standard Chartered Bank (China) Limited
  - 港島總區刑事第一隊總督察
  - Artist 孫耀威
  - Academia and research fields
  - For more, check out:
    - [www.cse.cuhk.edu.hk/v7/en/cs/alumni.html](http://www.cse.cuhk.edu.hk/v7/en/cs/alumni.html)
    - <http://www.cse.cuhk.edu.hk/alumni>



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# Laws

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- In HK, Laws are Common and Basic!
  - [www.doj.gov.hk/eng/laws](http://www.doj.gov.hk/eng/laws)
  - [www.legislation.gov.hk/eng/index.htm](http://www.legislation.gov.hk/eng/index.htm)
- Disclaimer:
  - This is NOT intended to be a law course
  - Consult your lawyer if needed

# Relevant Government Bodies and Laws

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- Office of the Privacy Commissioner for Personal Data  
個人資料私隱專員公署
  - Personal Data (Privacy) Ordinance 《個人資料(私隱)條例》
- Office of the Government Chief Information Officer (OGCIO)  
政府資訊科技總監辦公室
- Hong Kong Computer Emergency Response Team  
Coordination Centre (HKCERT) 香港電腦保安事故協調中心
  - Managed by the HK Productivity Council
- Hong Kong Police Force 香港警務處
  - Technology Crimes: [www.police.gov.hk/ppp\\_en/04\\_crime\\_matters/tcd](http://www.police.gov.hk/ppp_en/04_crime_matters/tcd)

# Relevant Government Bodies and Laws

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- Office of the Communications Authority (OFCA)  
通訊事務管理局
  - Telecommunications Ordinance 《電訊條例》
  - Broadcasting Ordinance 《廣播條例》
- Obscene Articles Tribunal 淫褻物品審裁處
  - Control of Obscene and Indecent Articles Ordinance  
《淫褻及不雅物品管制條例》
- Office for Film, Newspaper and Article Administration  
電影、報刊及物品管理辦事處(電影報刊辦)





# Relevant Government Bodies and Laws

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- Innovation and Technology Commission 創新科技署
  - Funds and Supports
- Hong Kong Science & Technology Parks 香港科技園
  - 香港科學園 + 創新中心 + 工業邨
- Intellectual Property Department 知識產權署
  - Trademarks
  - Patents
  - Designs
  - Copyright

# Other Government Bodies

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- Environmental Protection Department 環境保護署
- Electrical and Mechanical Services Department  
機電工程署
- Trade and Industry Department 工業貿易署
  - Import and Export (Strategic Commodities) Regulations (《進出口(戰略物品)規例》)  
[www.stc.tid.gov.hk/english/checkprod/sc\\_control.html](http://www.stc.tid.gov.hk/english/checkprod/sc_control.html)



# International / US Laws and Discussions

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- Can you export cryptography devices and technology from the US?
- Are you eligible to be sponsored by the HK government to apply for a patent?
- Is downloading and keeping child porn materials a criminal offence in HK?



# What is Ethics?

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- Study of what it means to “do the right thing”
- Assume people are rational and they can make free choices
- Rules to follow in our interactions and our actions that affect others

# The Spectrum of Choices and Actions

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- Superego/Sacrifice
  - e.g. use less to protect the environment
- Sunlight Test
  - <http://www.ethics.org.au/about/what-is-ethics>
- Act according to Policies and Guidelines
  - [www.cuhk.edu.hk/itsc/about/policies.html](http://www.cuhk.edu.hk/itsc/about/policies.html)
- Conformance to Laws and Compliance with Regulations
- Basal Standard (Bottom Line of Oneself)
  - e.g. even if laws are broken, I shall not harm life

# HKIE Rules of Conduct\*

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- Rule 1 - Responsibility to the Profession
  - A member of the Institution shall order his conduct so as to uphold the dignity, standing and reputation of the profession.
- Rule 2 - Responsibility to Colleagues
  - A member of the Institution shall not maliciously or recklessly injure nor attempt to injure whether directly or indirectly the professional reputation of another engineer, and shall foster the mutual advancement of the profession.

HKIE Rules of Conduct in Full:

[http://www.hkie.org.hk/docs/downloads/membership/HKIERulesofConduct\(2001Version\).pdf](http://www.hkie.org.hk/docs/downloads/membership/HKIERulesofConduct(2001Version).pdf)

# HKIE Rules of Conduct\*

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- Rule 3 - Responsibility to Employers or Clients
  - A member of the Institution shall discharge his duties to his employer or client with integrity and in accordance with the highest standards of business ethics.
- Rule 4 - Responsibility to the Public
  - A member of the Institution in discharging his responsibilities to his employer and the profession shall at all times be governed by the overriding interest of the general public, in particular their environment, welfare, health and safety.

HKIE Rules of Conduct in Full:

[http://www.hkie.org.hk/docs/downloads/membership/HKIERulesofConduct\(2001Version\).pdf](http://www.hkie.org.hk/docs/downloads/membership/HKIERulesofConduct(2001Version).pdf)

# What Drives Us?

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- Knowledge
- Philosophy
- Religion
- Faith/Hope
- Insight
- Experience
- Tradition
- Desire/Expectations
- Convention/ Norm
- Value and Judgement



Why?







# Discussions

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- You are a IT staff of a company
  - Your boss asked you to install a single piece of software on 5 PC's
  - Is it legal?
  - Are you legally responsible?
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- How about installing 5 instances of the software on Virtual PC's?



# Discussions

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- Do you need a license to operate a website to keep money for customers and offer them interest by trading online game weapons?
- How about keeping game points instead?



# Discussions

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- Is it ok to develop a Facebook App which offers free services in exchange of obtaining users' personal information for marketing purposes?
- How about transferring the information to another company?



# Summary

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- Computers bring forth the Digital Age
- Modern Society relies heavily on Computers
- It is Our Profession!
- It has been advancing exponentially!
  - Moore's Law



# Summary

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- There are certainly opportunities, issues, risks and controls
- What are the impacts?
- What are the costs?
- What are the risks?



With reference to materials from:

# A Gift of Fire

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Third edition

Sara Baase

## Chapter 1: Unwrapping the Gift

also materials and photos from the Internet.



# Assigned Readings

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- Articles and videos on Course Website
- HK Police Force Technology Crime Division
  - [www.police.gov.hk/ppp\\_en/04\\_crime\\_matters/tcd](http://www.police.gov.hk/ppp_en/04_crime_matters/tcd)
- Patent Application Grant page
  - [www.itc.gov.hk/en/funding/pag.htm](http://www.itc.gov.hk/en/funding/pag.htm)



## Further Questions/ Discussions

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- What is 「不誠實使用電腦」  
(Unauthorised access to computer by telecommunication)?
- Think of a revenue model for money laundry related email spam.
- If you are a director of a company, can you apply for the Patent Application Grant?





## \* HKIE Disclaimer

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