COMP7503A Multimedia Technologies

Course Information

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THE UNIVERSITY OF HONG KONG

DEPARTMENT OF COMPUTER SCIENCE

COMP7503
2025-2026

Contact Information

- Instructor: Dr. Bill LUO
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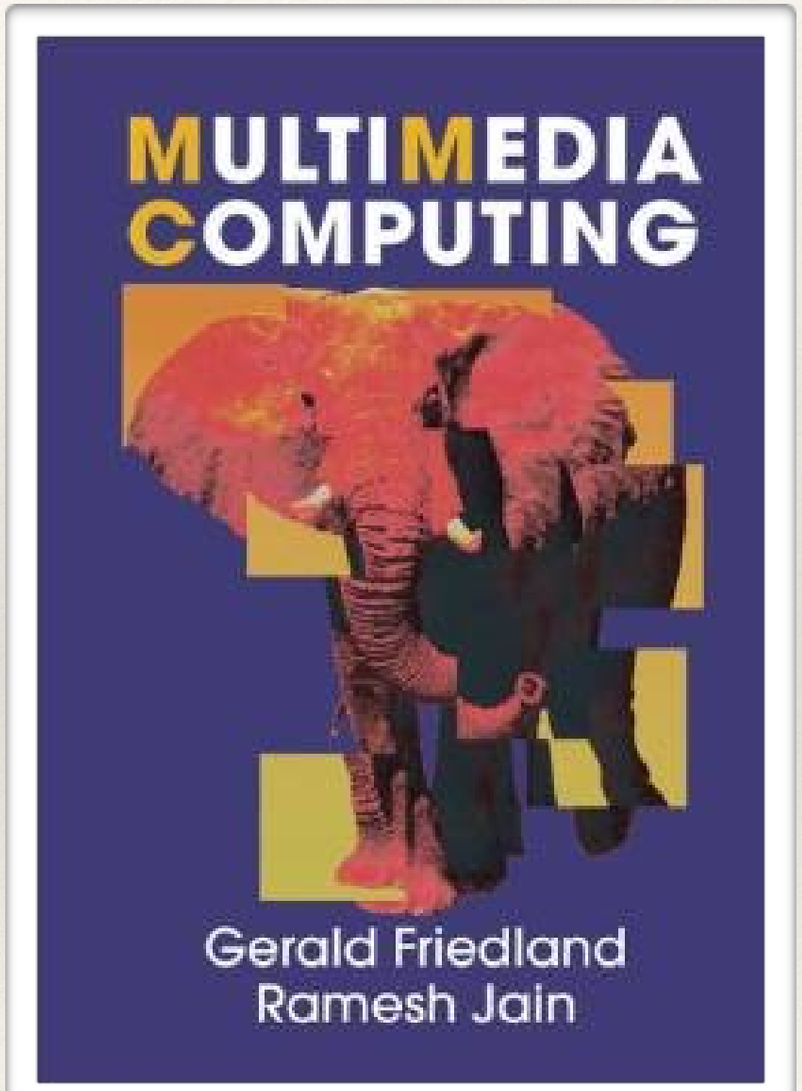
  - Consultation Hour: Mon. 6:15 pm - 6:45 pm or by appointment

TA: Shen Sitong

- Email: shenst@connect.hku.hk
- Consultation Hour:

Course Information

- **Course Code**
  - COMP7503A
- **Lectures**
  - Time: Mon. 7:00pm - 10:00pm
  - Venue: LE-5
- **Course Homepage**
  - Login Moodle (http://moodle.hku.hk) using your HKU portal account
  - https://moodle.hku.hk/course/view.php?id=127947
- **Textbook**
  - Title: Multimedia Computing
  - Authors: Gerald Friedland & Ramesh Jain
  - ISBN
    - ISBN-13: 978-0521764513
    - ISBN-10: 0521764513
  - For students who would like to get their own copies, they can place special order with full deposit payment at HKU bookstore. Orders would be available around 6 weeks upon order confirmation.
  - Electronic version



Consultation Channels

- Discussion Forums (Moodle)
  - Questions concerning assignments and projects can be posted, peer discussion is encouraged.
- Face-to-Face Meeting
  - Seek advice from instructor and tutor during their consultation hours.
  - Always make appointment by e-mail first if you need face-to-face meeting.
- E-mail
  - Whenever you encounter personal difficulties in the course that may not be appropriate for public discussion in moodle, you can e-mail instructor and/or tutors.

Course Outline

Image we See …

Network we Transmit …

Msg we Communicate …

Voice we Hear …

Video we Take …

Lock we Protect …

Doc we Write …

Course Outline

- Introduction of Multimedia Computing
- Sensor Technologies
- Perception, Recording and Reproduction of Sounds, Images and Videos
- Representation of Multimedia Document
- Multimedia Authoring Environment
- Multimedia Synchronization in Spatial and Temporal Domain
- Media Delivery, Quality of Service (QoS), Quality of Experience (QoE)
- Multimedia Information Retrieval and Content Analysis
- Future Topics in Multimedia

Topics Coverage is Broad by Nature

- Multimedia is broad by nature, and therefore
  - In the first half of the course we cover preliminary fundamentals, including sensing, reproduction and human perception of all these types of media
    - These would serve as the pillars for students to further their study in other MSc courses such as “Image Processing and Computer Vision”, “User Interface Design and Development”, “Visualisation and visual analytics”
  - In the remaining half of the course, we shall dig deep in the technical aspects of selected areas, which will not be overlapping with the aforementioned MSc courses

Expected Outcomes

- Course Learning Outcomes
  - Able to master the key technologies about multimedia systems
  - Able to design, evaluate and implement a multimedia application based on latest multimedia technologies
- These course learning outcomes correspond to the following MSc(CS) Programme Learning Outcomes

General Learning Outcomes (GLO)	
~~*PO1.*~~	~~The ability to develop, monitor and update a plan, to reflect a changing operating environment;~~
~~*PO2.*~~	~~The ability to monitor and adjust a personal programme of work on an on-going basis, and to learn independently;~~
PO3.	The ability to exercise initiative and personal responsibility, which may be as a team member or leader;
PO4.	The ability to learn new theories, concepts, methods etc and apply these in unfamiliar situations.
Specific Learning Outcomes (SLO) *II. Engineering analysis*	
PO8.	The ability to use fundamental knowledge to investigate new and emerging technologies;
PO9.	The ability to apply appropriate models for solving problems in engineering, and the ability to assess the limitations of particular cases;
PO10.	The ability to collect and analyse research data and use appropriate engineering tools to tackle unfamiliar problems, such as those with uncertain or incomplete data or specifications, by the appropriate innovation, use or adaptation of engineering analytical methods.
PO11.	The ability to apply original thought to the development of practical solutions for products, systems, components or processes.

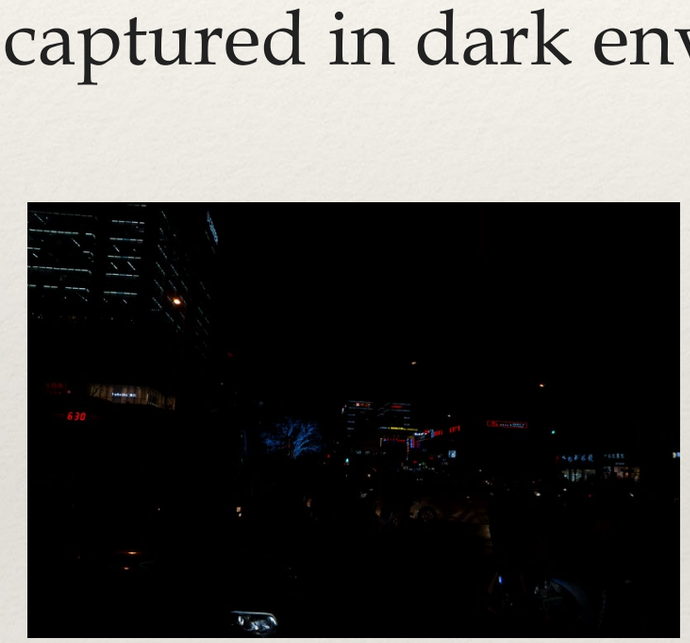
Specific Learning Outcomes (SLO) *I. Underpinning science and mathematics, etc.*	
PO5.	A comprehensive understanding of the relevant scientific principles of the specialisation.
PO6.	A critical awareness of current problems and/or new insights much of which is at, or informed by, the forefront of the specialization.
PO7.	An understanding of concepts relevant to the discipline, some from outside engineering, and the ability to critically evaluate and apply them effectively.

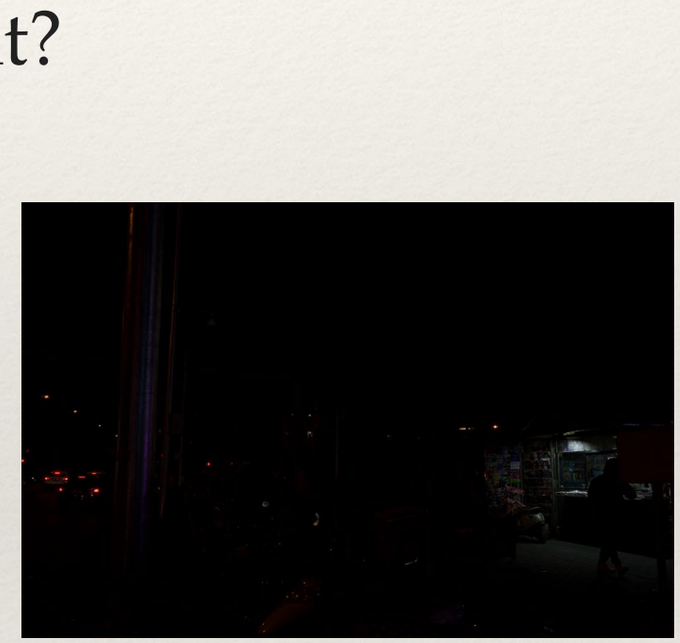
Specific Learning Outcomes (SLO) *III. Economics, social and environmental context*	
~~*PO12.*~~	~~Knowledge and understanding of management and business practices, and their limitations, and how these may be applied appropriately, in the context of the particular specialisation;~~
~~*PO13.*~~	~~The ability to make general evaluations of risks through some understanding of the basis of such risks.~~

Specific Learning Outcomes (SLO) *IV. Engineering practice*	
PO14.	A thorough understanding of current practice and its limitations, and some appreciation of likely new developments;
PO15.	Advanced level knowledge and understanding of a wide range of engineering materials and components;
PO16.	The ability to apply engineering techniques taking account of a range of commercial and industrial constraints.

What job you cannot get?

- Q: I am the CEO of Camera Tomorrow. Can you be our engineer to develop an algorithm to enhance the image our camera captured in dark environment?

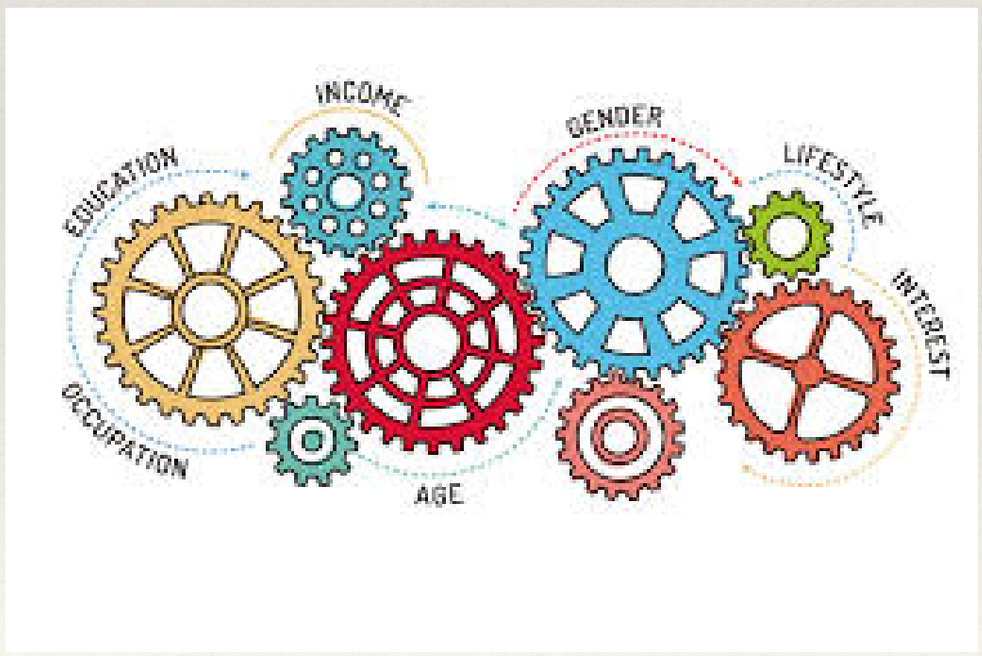




- *Sorry, we will not focus on the details of multimedia data processing, like image, video and speech processing. Image processing will be covered in other courses, like COMP7502 Image Processing and computer vision.*

What job you cannot get? (Cont'd)

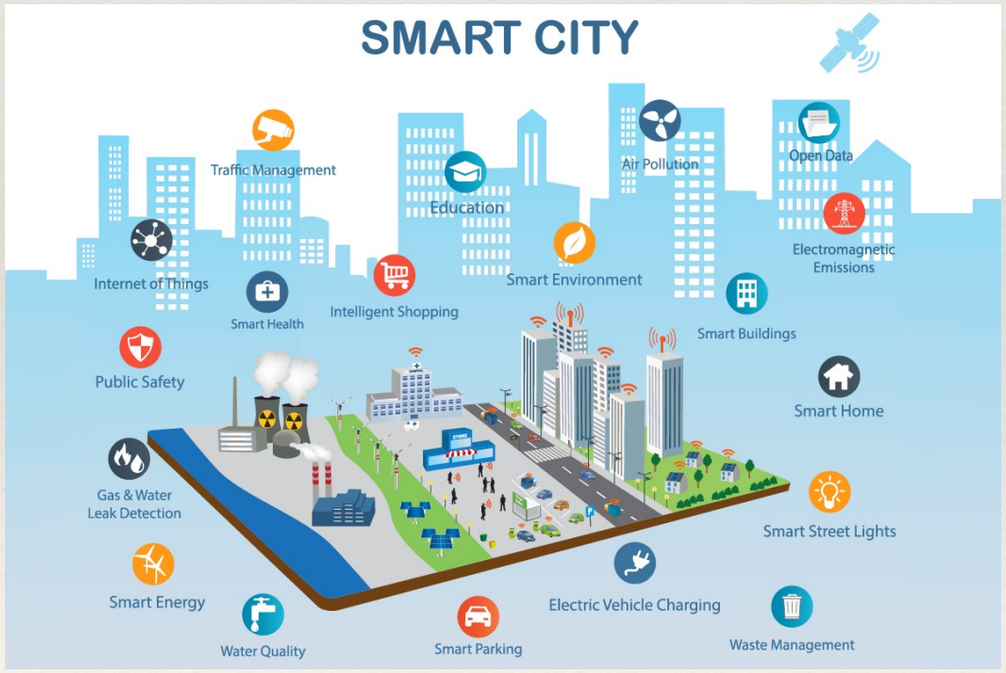
- Q: I am the President of Advertisement Tomorrow. Can you be the data scientist to analyze all the social media data from our customers including videos watched on Youtube, images posted on Facebook, Instagram, to estimate their education, lifestyle, interest then push them the most related ads?



- *Sorry, We will not focus on the multimedia data analyze and mining. It will be covered in the course COMP7103 Data mining.*

What job you can get?

- Q: I am the Mayor of City Tomorrow. Now City Council granted us some budget to build a smart city. Can you be the Chief Architect to design a system to process the data from different IoT sensors?



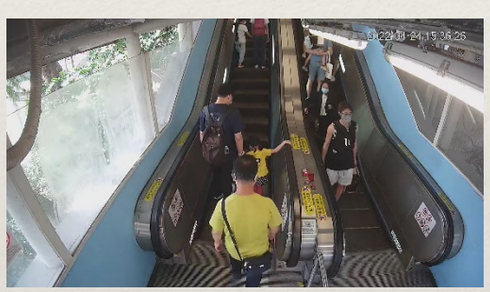
- *YES. In this course, you are trained to design and build a unified process to percept, record and reproduce multimedia data like all these kinds of sensor data.*

Industry Application in HK

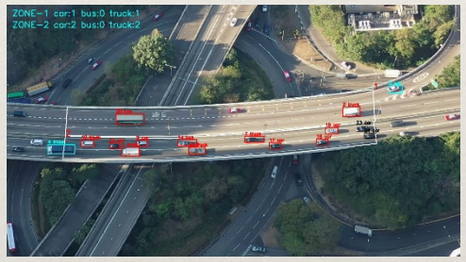
https://itshk.org/

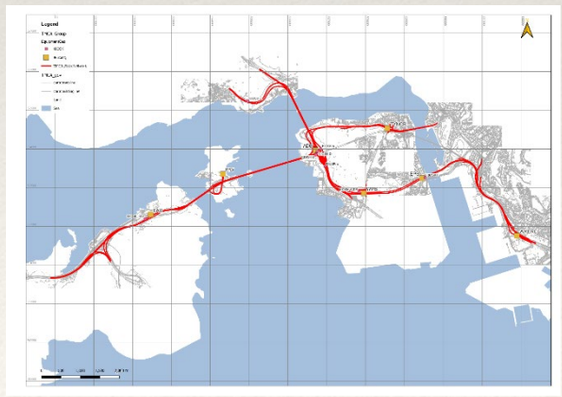
https://www.citf.cic.hk/

MTR escalator monitoring system



Drone based Traffic monitoring system





← Traffic Control and Surveillance System

Assessments

- Final Examination (50%)
- In Course Assessment (50%)
  - 1 Written Assignment (10%)
  - Quiz (20%), scheduled to 20 Oct
  - 1 Programming Assignment (20%)
-

Roll-call won't contribute any marks in course assessment

Class Attendance

- CEF (Continuing Education Fund) For COMP7503
  - Eligible students who wish to claim CEF reimbursement from the government must attend more than 70% of the classes. Students who would like to claim CEF reimbursement have to use the Attendance@HKU mobile app for attendance taking.
- Go to https://www.its.hku.hk/services/communication/mobile-app
  - Available on App Store (iOS devices) and Google Play (Android devices)

CEF course code

- CEF (Continuing Education Fund) course code
  For COMP7503

Programming	Course Code	Effective date
MSc(CompSc)	36Z122377	January 2020
MSc(ECom&IComp)	36Z123837	January 2020
MDASC	42Z123846	January 2020

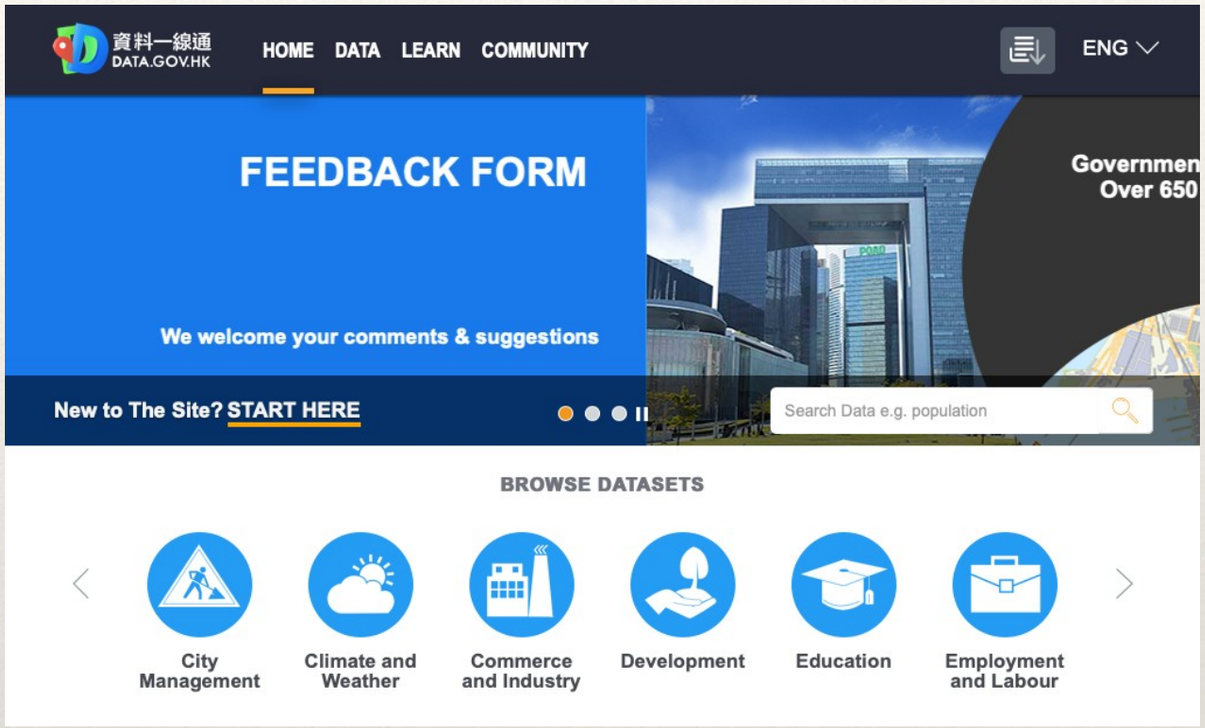
https://www.wfsfaa.gov.hk/cef/en/preparation/course_search_detail.php?i=36Z122377&course_code=36Z122377

Class Schedule

	Date	*Time*	*Venue*	*Remark*
Lecture 01	01 Sep 2025	7:00pm - 10:00pm	LE-5	
Lecture 02	08 Sep 2025	7:00pm - 10:00pm	LE-5	
Lecture 03	15 Sep 2025	7:00pm - 10:00pm	LE-5	
Lecture 04	22 Sep 2025	7:00pm - 10:00pm	LE-5	**Release of Written Assignment**
Lecture 05	29 Sep 2025	7:00pm - 10:00pm	LE-5	**Release of Programming Assignment**
Lecture 06	20 Oct 2025	7:00pm - 10:00pm	LE-5	**Quiz & Programming Tutorial**
Lecture 07	27 Oct 2025	7:00pm - 10:00pm	LE-5	
Lecture 08	03 Nov 2025	7:00pm - 10:00pm	LE-5	
Lecture 09	10 Nov 2025	7:00pm - 10:00pm	LE-5	
Lecture 10	17 Nov 2025	7:00pm - 10:00pm	LE-5	

Programming Assignment

- Skills and Knowledge required
  - Javascript
  - Linux
- Topic
  - Smart City Use Cases based on Open Data
    - Data Source: https://data.gov.hk/en/
- Development Platform
  - Docker
    - Reference: https://www.docker.com/
  - NodeRed
    - Reference: https://nodered.org



Plagiarism Policy

- For the definition of Plagiarism, please refer to
  - http://www.hku.hk/plagiarism
  - Basically, it means
    - Do your own work
    - Don't copy from others' works
    - If you need to adopt some others' works/materials, give proper acknowledgements and references
- Plagiarism Penalty
  - **First Attempt:**
    - ***Students (both the source provider and copier) who admit committing plagiarism for the first time shall be warned in writing and receive a zero mark for the component concerned. For those who do not confess, the case would be referred to the Programme Director for consideration.***
  - **Subsequent Attempt:**
    - ***If students (both the source provider and copier) commit plagiarism more than once during the course of studies, the case shall be referred to the Programme Director for consideration. The Programme Director will investigate the case and consider referring it to the University Disciplinary Committee, which may impose any of the following penalties: a published reprimand, suspension of study for a period of time, fine, or expulsion from the University.***

Learning Hours

- Total 150 hrs

Component	Learning Hours
Final Examination	30 hrs
Written Assignment	15 hrs
Programming Assignment	40 hrs
Quiz	15 hrs
Lectures	30 hrs
Self-Study	20 hrs
Total:	150 hrs

Questions?