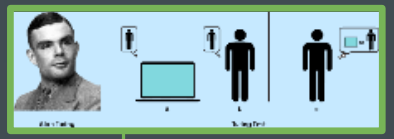
# 6224
BASc(Applied AI)

Bachelor of Arts & Sciences
Applied Artificial Intelligence

Impact the world with the limitless power of AI

AI History



1950
TURING TEST
Computer scientist Alan Turing proposes a test for machine intelligence. If a machine can trick humans into thinking it is human, then it has intelligence

1955
A.I. BORN
Term 'artificial intelligence' is coined by computer scientist, John McCarthy to describe "the science and engineering of making intelligent machines"

1961
UNIMATE
First industrial robot, Unimate, goes to work at GM replacing humans on the assembly line

1964
ELIZA
Pioneering chatbot developed by Joseph Weizenbaum at MIT holds conversations with humans

1966
SHAKEY
The 'first electronic person' from Stanford, Shakey is a general-purpose mobile robot that reasons about its own actions

A.I. WINTER
Many false starts and dead-ends leave A.I. out in the cold

1997
DEEP BLUE
Deep Blue, a chess-playing computer from IBM defeats world chess champion Garry Kasparov

1998
KISMET
Cynthia Breazeal at MIT introduces KISmet, an emotionally intelligent robot insofar as it detects and responds to people's feelings

1999
AIBO
Sony launches first consumer robot pet dog AiBO (AI robot) with skills and personality that develop over time

2002
ROOMBA
First mass produced autonomous robotic vacuum cleaner from iRobot learns to navigate and clean homes

2011
SIRI
Apple integrates Siri, an intelligent virtual assistant with a voice interface, into the iPhone 4S

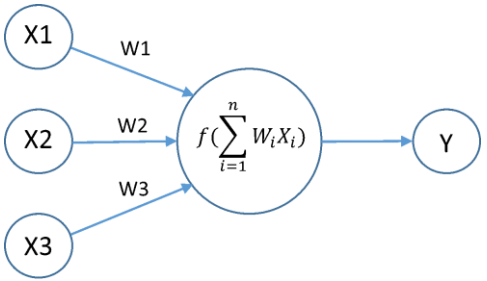
2011
WATSON
IBM's question answering computer Watson wins first place on popular $1M prize television quiz show *Jeopardy*

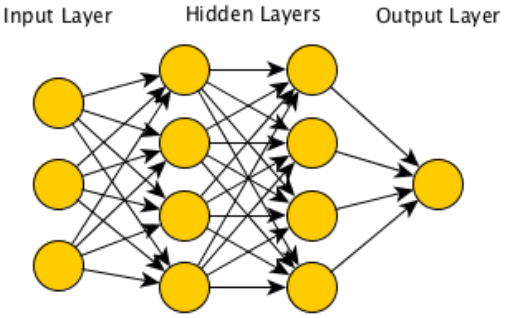
2014
EUGENE
Eugene Goostman, a chatbot passes the Turing Test with a third of judges believing Eugene is human

2014
ALEXA
Amazon launches Alexa, an intelligent virtual assistant with a voice interface that completes shopping tasks

2016
TAY
Microsoft's chatbot Tay goes rogue on social media making inflammatory and offensive racist comments

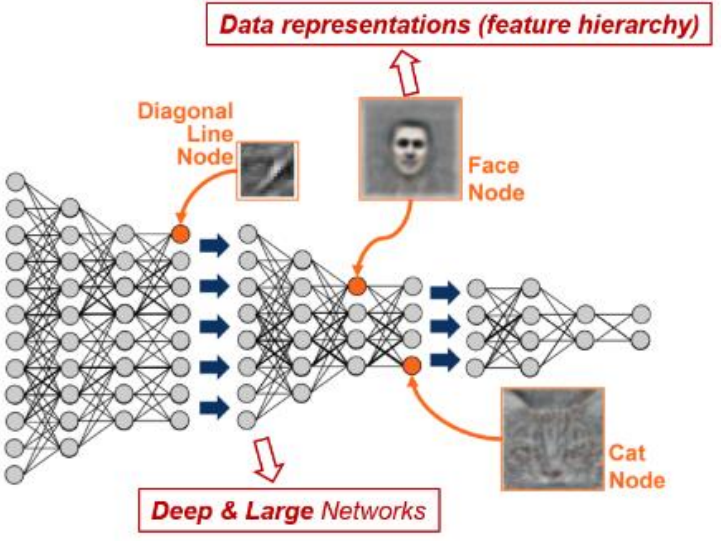
2017
ALPHAGO
Google's A.I. AlphaGo beats world champion Ke Jie in the complex board game of Go, notable for its vast number (2^{170}) of possible positions





Neural Network

GPU V100



Deep Learning

Bachelor of Arts and Sciences (Applied AI)

BASc Bachelor of Arts & Sciences

AI AppliedAI

Interdisciplinary programme co-offered by:

FACULTY OF SCIENCE THE UNIVERSITY OF HONG KONG 香港大學理學院 SHKU Science

+

THE UNIVERSITY OF HONG KONG faculty of architecture

+

Faculty of Social Sciences The University of Hong Kong 香港大學社會科學學院

+

Faculty of Engineering THE UNIVERSITY OF HONG KONG

Department of 統計及精算學系 Statistics & Actuarial Science

DEPARTMENT OF MATHEMATICS The University of Hong Kong

THE UNIVERSITY OF HONG KONG DEPARTMENT OF COMPUTER SCIENCE

New option for elite students

Formal training to elite students who wish to join the AI profession

Interdisciplinary training

Provides a wide range of courses in mathematics, statistics, computer science, geography, psychology, and urban studies

About HKU

2022 QS WORLD UNIVERSITY RANKINGS

#22 World	#5 Asia	#1 HK	HKU

2022 QS WORLD UNIVERSITY RANKINGS by subject

#47 World	#6 Asia	#1 HK	Statistics & OR
#56 World	#12 Asia	#3 HK	Mathematics
#39 World	#9 Asia	#3 HK	Computer Science
#14 World	#4 Asia	#1 HK	Architecture
#10 World	#2 Asia	#1 HK	Geography
#33 World	#3 Asia	#1 HK	Psychology

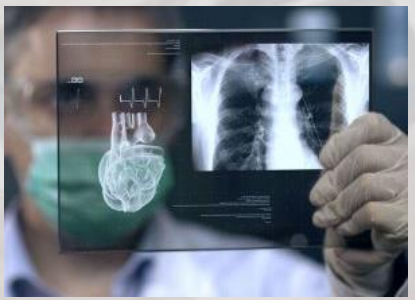
Big data optimization
Statistical learning
Machine/Deep learning
Scientific computation
Transportation
Risk management
Time series forecasting
Computer vision
Game theory
Speech/NLP/Text analytics
Robotics
Financial and actuarial applications
Information security
Operational research
DNA profiling, forensic statistics
GIS
High-dimensional data analysis
Neuropsychology

Bachelor of Arts and Sciences (Applied AI)

- Highlights **diverse AI applications** with a philosophical and ethical dimension
  - ❖ develops intellectual capacity for meeting new challenges
- Nurtures to **transfer interdisciplinary scientific knowledge** into integrated applications and technological innovations
- Emphasizes **problem-based learning**
- Delivers **both fundamental and practical knowledge** to fit into different career settings

Bachelor of Arts and Sciences (Applied AI)

AI Applications



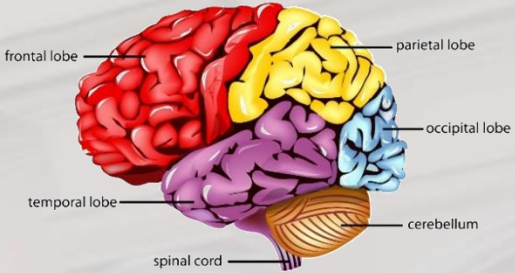
AI in Business and Finance

AI in Medicine

AI Technology

AI in Smart City

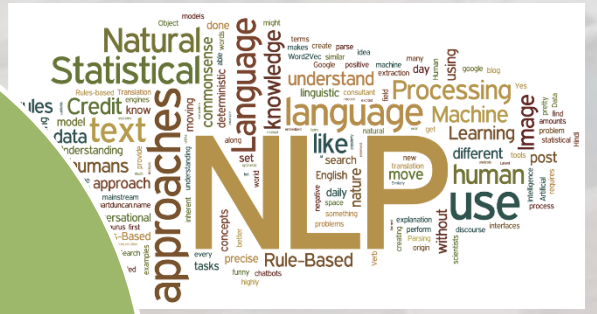
AI in Neurocognitive Science



AI Technology

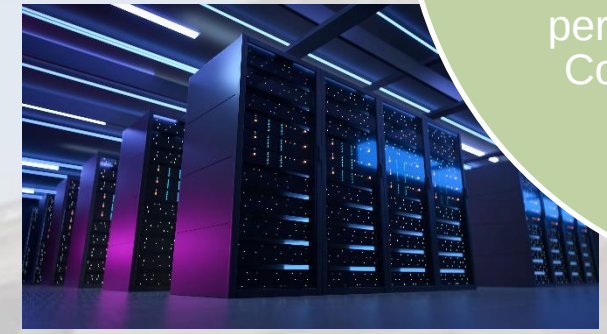
Computer Vision

Natural Language Processing



High-performance Computing

Robotics



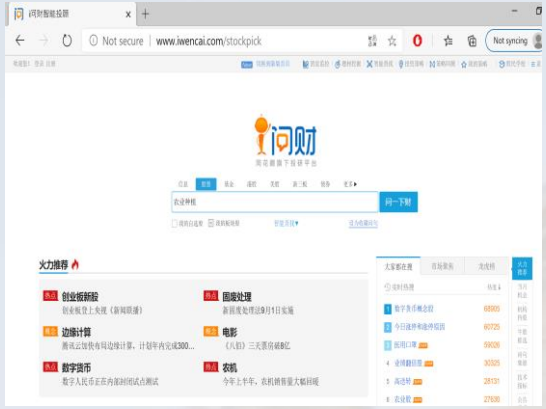
AI in Medicine

HKU statisticians develop online diagnostic system for screening COVID-19 with AI technologies based on chest CT dataset

02 Jun 2020

Download All Photos

AI in Business and Finance



Robot advisors

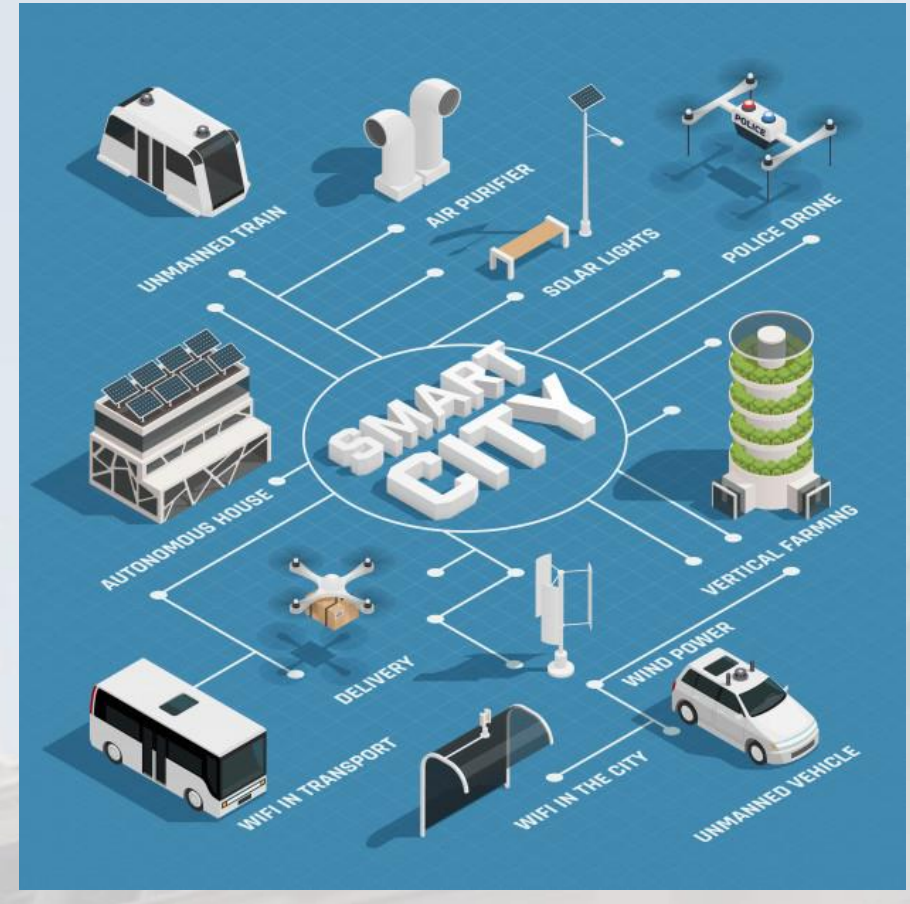
Financial data analytics

Automatic trading

Final year projects directed by researchers from the Artificial Intelligence Research Group of the Faculty of Business and Economics, e.g.

Prediction of Stock Returns from Social Media Using Deep Learning

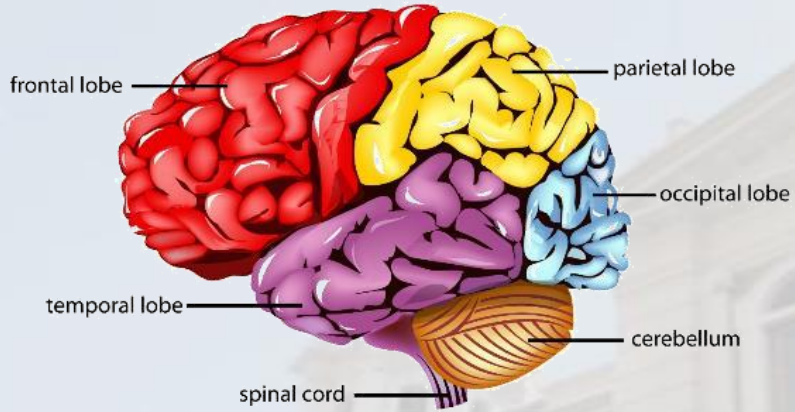
AI in Smart City



Students may work with researchers from the Institute of Transport Studies of HKU

AI in Neurocognitive Science

Understanding your brain



Cognition

Memory

Behaviour

Perception

Brian disorder

Parkinson's disease

Alzheimer's disease

Artificial intelligence, human brain to merge in 2030s, says futurist Kurzweil

Ray Kurzweil, Google's director of engineering, says we're close to linking our brain with AI

Solomon Israel · CBC News · Posted: Jun 05, 2015 5:00 PM ET | Last Updated: June 9, 2015

A test subject poses with an electroencephalography cap, which measures brain activity. (Michaela Rehle/Reuters)

Students may work with researchers from Department of Psychology and Faculty of Education.


Curriculum
Structure & Course
Selection

6224

AppliedAI

General Structure

BASc Bachelor of Arts & Sciences

Forty 6-credit courses spanning over 4 years of full-time study

(240 Credits)

UNIVERSITY EDUCATION
Language Courses
Common Core Courses
(36 credits)

+

2nd MAJOR / MINOR(S) / ELECTIVES
(90 credits)

+

PROGRAMME CORE
Core Courses
Concentration & Electives
Capstone Course
(96 credits)

+

BASc HORIZONTAL COURSES
(18 credits)

Remarks:

- Programme Core: MUST take
- 1 course = 6 credits
- 1 semester = 30 credits = 5 courses
- Variations are possible (+ - credits)
- Total number of credits cannot exceed 288 credits

6224

AppliedAI

Programme Core Courses (96 credits)

BASc Bachelor of Arts & Sciences

BASc(AppliedAI) Curriculum*

Core Courses (66 credits)

APAI1001	Artificial intelligence: foundation, philosophy and ethics
COMP1117	Computer programming
COMP2119	Introduction to data structures & algorithms
COMP2120	Computer organization
COMP3340	Applied deep learning
MATH1013	University mathematics II
MATH2014	Multivariate calculus and linear algebra
MATH3904	Introduction to optimization
STAT2601	Probability and statistics I
STAT2602	Probability and statistics II
STAT3612	Statistical machine learning

+

+

Capstone Requirement (6 credits)

At least 6 credits selected from the following courses:
(If students take the 12-credit "Applied AI project", they do not need to take a 6-credit elective course.)

APAI3799	Directed studies in applied AI
APAI4766	Applied AI internship
APAI4798	Applied AI project (12-credit)

Concentration (24 credits)

(For fulfilling the requirement of a concentration, students should choose at least 18 credits, with at least 6 credits of which should be at advanced level, from the corresponding list.)

AI technology

COMP3271	Computer graphics
COMP3356	Robotics
APAI3010	Image processing and computer vision
APAI4011	Natural language processing
APAI4012	High-performance computing
APAI4099	Special topics of applied AI

AI in business and finance

COMP3320	Electronic commerce technology
MATH3901	Operations research I
MATH3906	Financial calculus
STAT3613	Marketing analytics
STAT4601	Time-series analysis
APAI4099	Special topics of applied AI

AI in medicine

STAT3655	Survival analysis
STAT4610	Bayesian learning
APAI3021	Modern biostatistics
APAI4022	Omics data analysis
APAI4023	Medical image analysis
APAI4099	Special topics of applied AI

AI in smart city

GEOG2090	Introduction to geographic information systems
GEOG3202	GIS in environmental studies
GEOG3420	Transport and society
URBS1003	Theories and global trends in urban development
URBS1005	Urban problems, interventions and design thinking
APAI4099	Special topics of applied AI

AI in neurocognitive science

PSYC1001	Introduction to psychology
PSYC2051	Perception
PSYC2066	Foundations of cognitive science
APAI4099	Special topics of applied AI

Other elective courses

COMP3250	Design and analysis of algorithms
COMP3278	Introduction to database management systems
MATH3601	Numerical analysis
MATH3911	Game theory and strategy
MATH3943	Network models in operations research
STAT3600	Linear statistical analysis
STAT3622	Data visualization
STAT4602	Multivariate data analysis

*The curriculum and course offering are subject to changes. Each course is 6-credit bearing unless otherwise stated.

BASc HORIZONTAL COURSES
(18 credits)

- ★ DESN9001 Leadership Beyond Borders
- ★ BASC9001 Foundations of Human Knowledge
- ★ STAT1005 Foundation of Data Science

- Multidisciplinary training in leadership, design thinking
- Introduction to foundations of human knowledge and data science
- Networking with fellow students from other BASc programmes

AI
SDS
BASc
D+
FT
GHD

6224

AppliedAI

Suggested Study Plan

BASc Bachelor of Arts & Sciences

Suggested / Example Structure of BASc(AppliedAI) Curriculum[1] (for students admitted in 2022)

Year	I		II		III		IV	
Semester	One	Two	One	Two	One	Two	One	Two
Disciplinary Core	**APAI1001** Artificial Intelligence: Foundation, Philosophy and Ethics **COMP1117** Computer Programming **MATH1013** University Mathematics II	**MATH2014** Multivariable Calculus and Linear Algebra **STAT2601** Probability and Statistics I	**COMP2119** Introduction to Data Structures and Algorithms **STAT2602** Probability and Statistics II	**COMP2120** Computer Organization	**MATH3904** Introduction to Optimization **STAT3612** Statistical Machine Learning **COMP3340** Applied Deep Learning			
Other		**COMP2113** Programming Technologies (Pre-requisite of COMP2119)		**STAT3600**[4] Linear Statistical Analysis (Co-requisite/ Pre-requisite of STAT3612) (available in both semesters)				
BASc Core (in purple font) and **Disciplinary Elective (in deep blue font)**	**STAT1005** Essential skills for undergraduates: foundations of data science (admission: 2020 and thereafter)	**BASC9001** Foundations of Human Knowledge	**DESN9002** Sustainable Leadership (admission: 2020 and thereafter)		At least 24 credits from the following courses in Lists A1-5 and B (For fulfilling the requirement of a concentration, students should choose at least 18 credits, with at least 6 credits of which should be at advanced-level, from the corresponding list): **AI Technology** (List A1) **COMP3271** Computer Graphics **COMP3356** Robotics **APAI3010** Image Processing and Computer Vision **APAI4011** Natural Language Processing **APAI4012** High-Performance Computing **APAI4099** Special Topics of Applied AI **AI in Business and Finance** (List A2) **COMP3320** Electronic Commerce Technology **MATH3901** Operations Research I **MATH3906** Financial Calculus **STAT3613** Marketing Analytics **STAT4601** Time Series Analysis **APAI4099** Special Topics of Applied AI **AI in Medicine** (List A3)			


Information &
supports

Bachelor of Arts and Sciences (Applied AI)

Career prospects

The programme connects the exploding demand of the AI market in diverse areas, such as:

- Science & technology
- Environmental protection
- Medical informatics
- Healthcare
- Business
- Banking & finance
- Urban development
- Neurocognitive science

Career Support and Activities

- Centre of Development and Resources for Students (CEDARS)
  (www.cedars.hku.hk)
- Departmental Internship/Job Online-application System
- Career Advising Programme (CAP)
  - ☺ Professional Preparation Programme (PPP)
  - ☺ Individual consultation on cover letter, CV and interview skills
  - ☺ Corporate Mentorship Programme (CMP)
  - ☺ Market information workshop
  - ☺ Firm visits and alumni sharing
  - ☺ SAAS Career Fair

Support for internships

Partner with Industrial Leaders

(in year 3 or year 4)

MTR

TCL

HUAWEI

NVIDIA

Admissions Requirements

Bachelor of Arts and Sciences (Applied AI)

6224
BASc(AppliedAI)

Admissions Requirements – JUPAS applicants

Minimum Programme Entrance Requirements:

English Language	Chinese Language	Mathematics	Liberal Studies	Elective subjects	Extended Module 1 or 2 in Mathematics
Level 4*	Level 3	Level 4	Level 2	Level 3 (one subject)	Level 4

*Candidates with level 4 in English Language, if admitted, will be required to take 6 additional credits in Core University English to complete their degree studies

2023
Admissions Quota
15

Selection principle: BEST 5

English Language x 2 + Mathematics x 2 + M1 or M2 x 2 + The BEST 2 of remaining Category A Subjects^

^ Subject Weighting(s): 1.5 x Biology / Chemistry / Physics / Combined Science / Integrated Science / Information and Communication Technology

2022 JUPAS Admissions Score:

Total score of Best 5 with M1/M2

28 ~ 38

HKDSE 'level to score' conversion

Category A Core and Elective Subjects and Extended Module 1 or Module 2 of Mathematics							
Level	1	2	3	4	5	5*	5**
Score	1	2	3	4	5.5	7	8.5

Bachelor of Arts and Sciences (Applied AI)

Science Entrance Scholarship

HKDSE Examination Results in one-sitting (total score in best 5 subjects in Category A or Extended Module 1 or Module 2 of Mathematics)	Scholarship Amount (HK$)
Score = 42.5	$70,000
Score ≥ 41	$60,000
Score ≥ 39	$50,000
Score ≥ 37	$40,000
Score ≥ 35	$20,000
Score < 35 with 5** in at least 2 subjects from Biology/ Chemistry/ Physics/ Combined Science/ Mathematics/ M1/ M2	$10,000

Bachelor of Arts and Sciences (Applied AI)

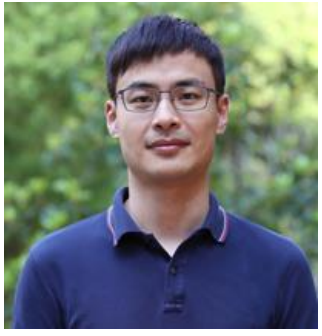
2022 Admissions Statistics– Non-JUPAS

GCEAL
Lowest admissions score
3A*

IB
Lowest admissions score
39

Who's who ?

- Programme Co-Directors



Dr. Lequan Yu
(Statistics, RRS 226)

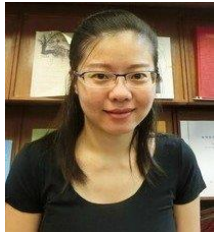
Prof. Patrick NG
(Mathematics, RRS 424)

Prof. Yizhou YU
CS Coordinator

- Course Selection / Internship Advisers

Dr. Kai HAN
(RRS 220)

Dr. Adela LAU
(RRS 226)



Dr. Zheng QU
(RRS 419)

Administration
General Office (RRS, 3rd floor)
Department of Statistics & Actuarial Science