

HKU AIIFL Webinar
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Ethical Development and Use of Artificial Intelligence

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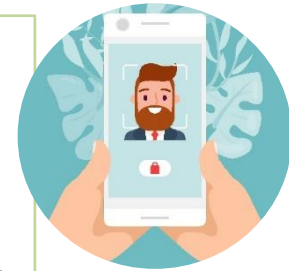


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What is Artificial Intelligence?

Artificial Intelligence

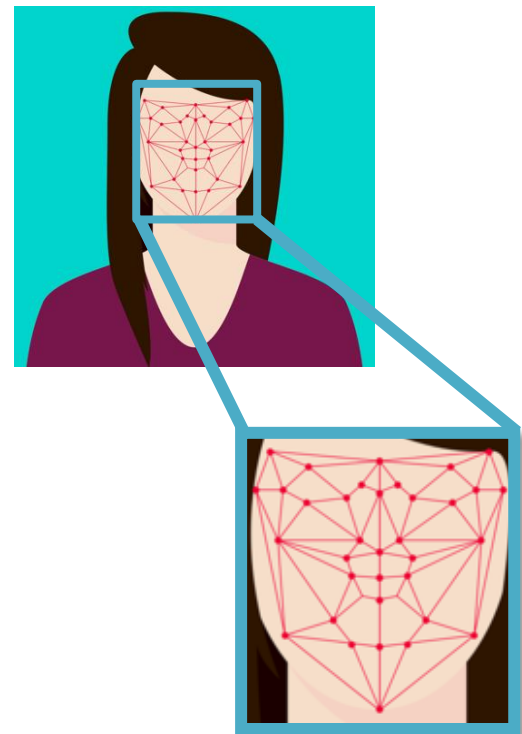
- Artificial intelligence (AI) refers to technologies that involve the use of computer programmes and machines to mimic the problem-solving or decision-making capabilities of human beings
- Examples of AI applications include:
 1. Facial recognition;
 2. Speech recognition;
 3. Chatbots;
 4. Data analytics; and
 5. Automated decision-making or recommendation.



Facial Recognition

Workflow

1. Capture the face of a target person
2. Analyse and record distinguishable landmarks of the face, i.e. nodal points
3. Convert location of nodal points into numerical data to formulate an unique face template
4. Compare the face template to other templates in a database to identify the target person



Picture source: Wikimedia Commons

3

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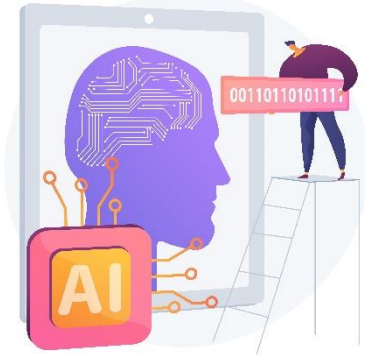


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Increasing Use of Artificial Intelligence

Background

1. AI has enormous potential to boost productivity and economic growth
2. AI is gaining popularity in Hong Kong
3. Privacy and ethical risks of AI are not negligible
4. Consensus on legal regulation is yet to form



Potential values of AI

- Google's study in 2020 showed that 78% of Hong Kong businesses believe that AI is beneficial; 62% of Hong Kong businesses expect to increase AI investment in future
- PwC's research in 2017 showed that global GDP could be up to 14% higher in 2030 as a net effect of using AI, mainly driven by:
 - a) Enhanced productivity;
 - b) Better personalisation of services and products; and
 - c) Improved quality of services and products.



Use of AI in the Financial Sector of Hong Kong

Financial Services

- McKinsey's global survey in 2019 showed that 62% of the respondents in the financial sector have applied at least one AI capability
- In 2019, the Hong Kong Monetary Authority reported that 89% of surveyed retail banks in Hong Kong adopted or planned to adopt AI applications
- The Hong Kong Academy of Finance's research report released in 2021 also suggested that 71% of surveyed financial services companies in the APAC region adopted or planned to adopt AI and Big Data technologies in the next 12 months



Examples of inaccurate and unfair AI



MIT News

Joy Buolamwini, a researcher in the MIT Media Lab's Civic Media group
Photo: Bryce Vickmark

Study finds gender and skin-type bias in commercial artificial-intelligence systems
Examination of facial-analysis software shows error rate of 0.8 percent for light-skinned men, 34.7 percent for dark-skinned women.


- Three facial recognition programmes showed a consistently higher error rate for identification of dark-skinned women (Source: [MIT News, 11 Feb 2018](#))



- Amazon's AI recruitment programme favoured male candidates owing to its male-dominated training data (Source: [The Guardian, 11 Oct 2018](#))

Amazon ditched AI recruiting tool that favored men for technical jobs

Specialists had been building computer programs since 2014 to review résumés in an effort to automate the search process



Metaverse – An Alternative World

Background

Apparently, it's the next big thing.
What is the metaverse?

© 18 October



Source: [BBC, 18 Oct 2021](#)

- Metaverse refers to a highly immersive virtual world where people gather to communicate in shared virtual spaces with the aid of AI-powered avatars
- It is envisaged that there will be a 'hyper-real' alternative world as the metaverse expands
- Is it the next big thing?

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Metaverse – Privacy Risks

The AP Interview: Facebook whistleblower fears the metaverse

By RAF CASERT and KELVIN CHAN November 10, 2021



Source: [AP News, 10 Nov 2021](#)

1. Excessive collection of data:

- More advanced equipment and sensors will be put in homes and workplaces for replicating our actions

2. Data Profiling:

- Users are giving up more to live in digital worlds

3. Spoofing

- Personal data may become susceptible to being copied, stolen, erased or manipulated

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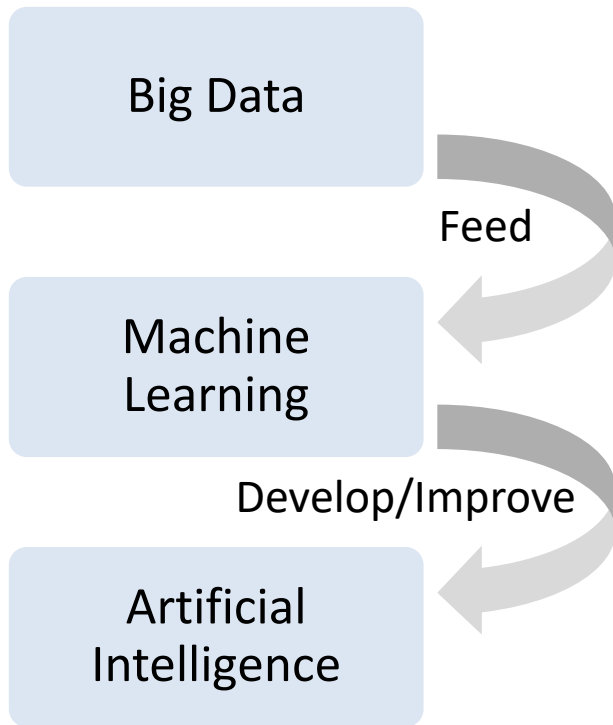
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Impacts of AI on Data Privacy



Possible Impacts on Privacy

- 1) Excessive Collection & Retention of Data
- 2) Lack of Transparency
- 3) Unpredictable Use
- 4) Bias and Discrimination
- 5) Re-identification



10

Challenges to Data Protection Principles

ALERT

Data
Minimisation

Purpose
Specification
& Limitation
of Use



Data
Accuracy

Transparency

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International Efforts on Promoting Ethical AI

OCT 2018
Global Privacy Assembly:

Declaration on Ethics and Data Protection in Artificial Intelligence



JAN 2019
Singapore:

Model Artificial Intelligence Governance Framework (First Edition)

MAR 2019
Japan:

Social Principles of Human-Centric AI



APR 2019
European Commission:

Ethics Guidelines for Trustworthy AI



MAY 2019
OECD:

Recommendation of the Council on Artificial Intelligence



SEP 2020
UNESCO:

First Draft of the Recommendation on the Ethics of Artificial Intelligence

OCT 2020
Global Privacy Assembly:

Resolution on Accountability in the Development and Use of AI



APR 2021
European Commission:

Proposal for a Regulation Laying Down Harmonised Rules on Artificial Intelligence



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“Guidance on the Ethical Development and Use of Artificial Intelligence”

Objectives

1. To provide guidance to enable organisations to develop and use AI in compliance with the requirements under the Personal Data (Privacy) Ordinance (PDPO) and in an ethical manner
2. To facilitate healthy development and use of AI in Hong Kong
3. To facilitate Hong Kong to become an innovation and technology hub and world-class smart city



13

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3 Data Stewardship Values

Being RESPECTFUL

to the rights, interests
and reasonable
expectations of
stakeholders

Being BENEFICIAL

by providing benefits
and minimising harm
to stakeholders

Being FAIR

by avoiding bias and
discrimination

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7 Ethical Principles for AI



1. ACCOUNTABILITY

Organisations should:

- Be responsible
- Be able to provide sound justifications for actions



2. HUMAN OVERSIGHT

The level of human involvement should:

- Be proportionate to the risks and impact of using AI

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7 Ethical Principles for AI



3. TRANSPARENCY & INTERPRETABILITY

Organisations should:

- Disclose their use of AI and relevant policies
- Strive to improve the interpretability of automated decisions



4. DATA PRIVACY

Organisations should:

- Put effective data governance in place to protect personal data privacy

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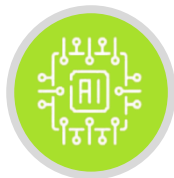
7 Ethical Principles for AI



5. FAIRNESS

Organisations should:

- Avoid bias and discrimination in the use of AI



6. BENEFICIAL AI

The use of AI should:

- Provide benefits
- Minimise harm to stakeholders



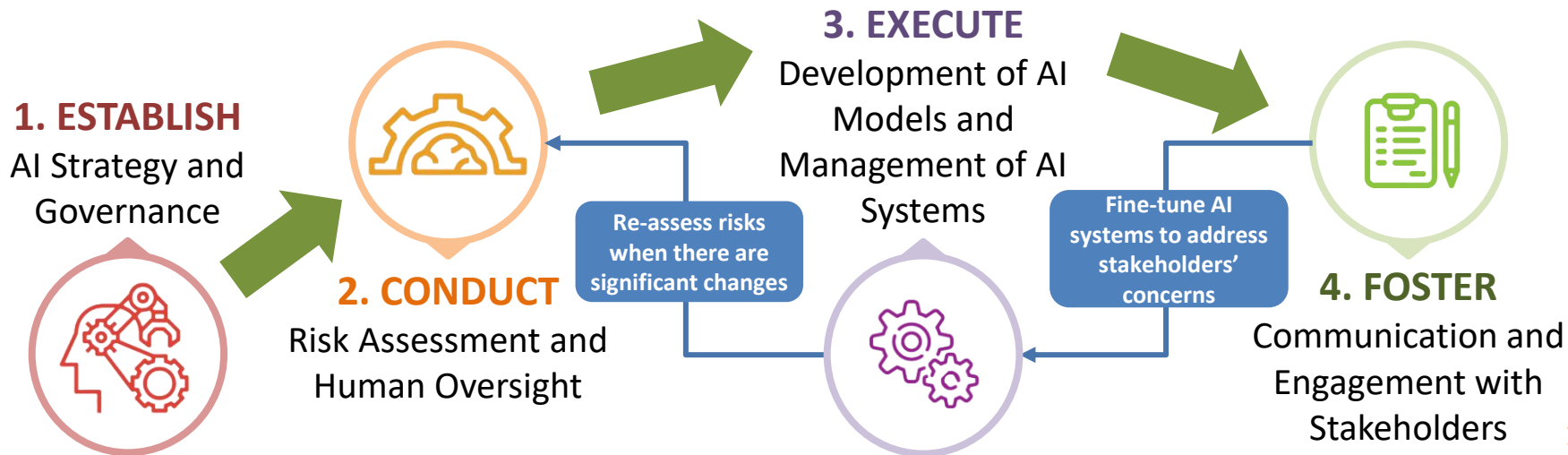
7. RELIABILITY, ROBUSTNESS & SECURITY

AI systems should:

- Operate reliably
- Be resilient to errors
- Be protected against attacks

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Practice Guide on 4 Major Business Processes for Ethical Development and Use of AI



18

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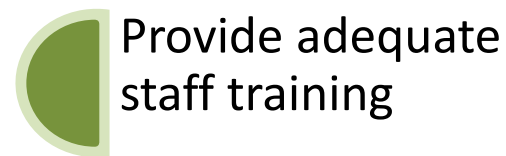
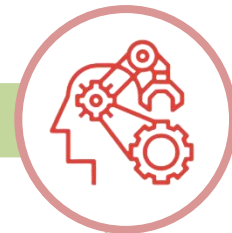
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1 of 4: ESTABLISH AI Strategy and Governance



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2 of 4: CONDUCT Risk Assessment and Human Oversight

STEP 1: Conduct a comprehensive and early risk assessment

STEP 2: Take a risk-based approach to adopting appropriate risk mitigation measures

STEP 3: Determine appropriate level of human oversight

20

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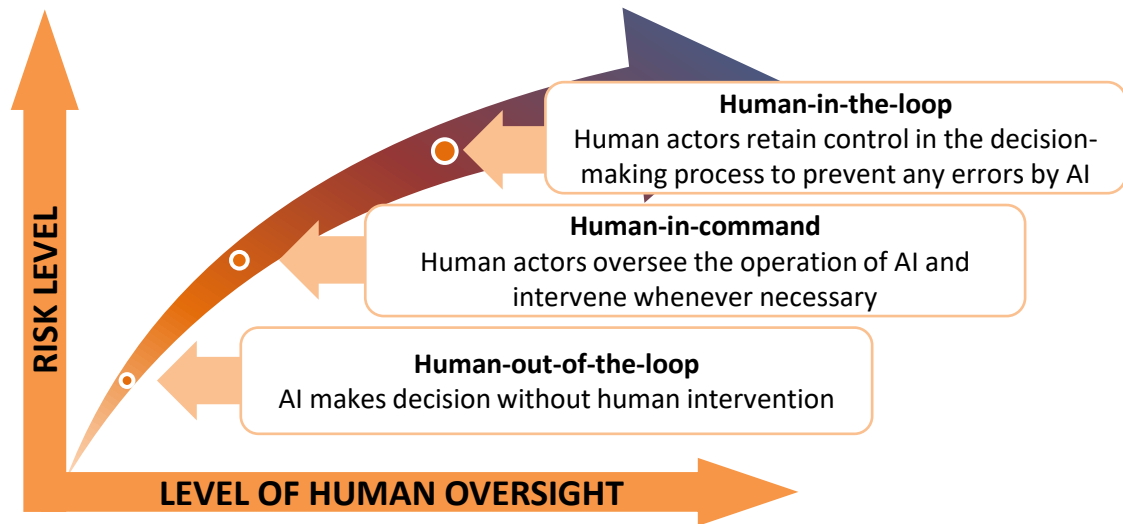
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2 of 4: CONDUCT Risk Assessment and Human Oversight

After assessing the risk:

- Adopt the risk-based approach to human oversight-



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3 of 4: EXECUTE Development of AI Models and Management of AI Systems



STAGE 1: Data Preparation

- Ensure compliance with the requirements under the relevant data protection law (e.g. principles of data minimisation, accuracy)

STAGE 2: Model Development

- Select appropriate machine learning algorithms
- Test AI models before use

STAGE 3: Ongoing Monitoring and Management

- Conduct human oversight
- Conduct evaluation and adjustments of AI strategy

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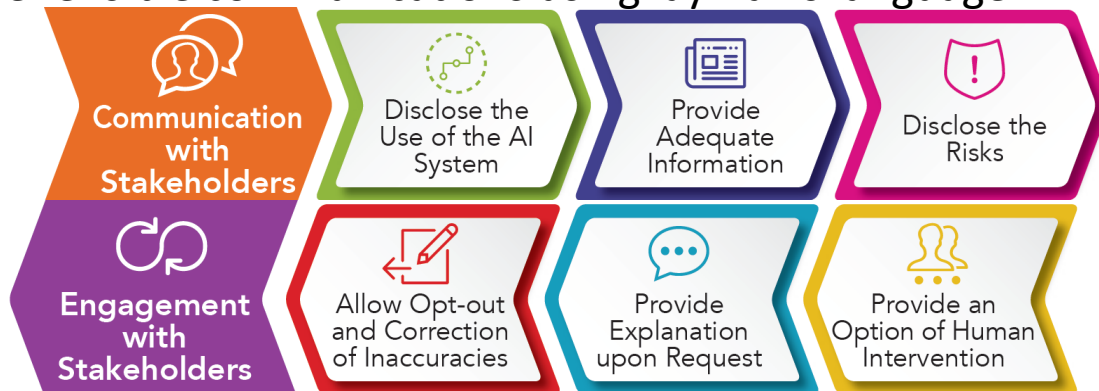


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4 of 4: FOSTER Communication and Engagement with Stakeholders



- Being transparent with stakeholders
- Channels for engagement with stakeholders
- Comprehensible communications using layman's language



23

Way Forward

1. Issuing guidance and best practices

- a) *HKMA: High-level Principles on Artificial Intelligence (2019)*
- b) *OGCIO: Ethical Artificial Intelligence Framework (2021)*

2. Raising awareness locally

3. Contributing to discussions locally and internationally

- a) *Public webinars/seminars on AI*
- b) *Roundtable events and research initiatives*
- c) *Collaborating with overseas counterparts, e.g. AI Working Group of Global Privacy Assembly, PDPC Singapore*

4. Legislation?

Thank you!

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Download the “Guidance on the Ethical Development and Use of Artificial Intelligence”