

PCPD Webinar
13 September 2021

Guidance on the Ethical Development and Use of Artificial Intelligence

開發及使用人工智能 道德標準指引

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What is Artificial Intelligence?

Artificial Intelligence

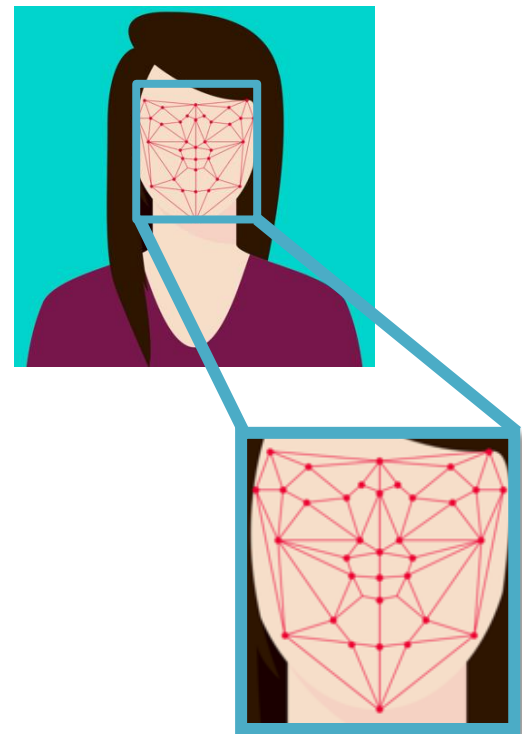
- Artificial intelligence (AI) refers to technologies that involve the use of computer programmes and machines to mimic the problem-solving or decision-making capabilities of human beings
- Examples of AI applications include:
 1. Facial recognition (臉容識別);
 2. Speech recognition (語音識別);
 3. Chatbots (聊天機械人);
 4. Data analytics (數據分析); and
 5. Automated decision-making or recommendation (自動化決策或建議).



Facial Recognition

Workflow

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



Picture source: Wikimedia Commons

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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 believed that AI is beneficial; 62% of Hong Kong businesses expected to increase AI investment in future
- PwC's research shows 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.



Bias and discrimination of AI

Millions of black people affected by racial bias in health-care algorithms

Study reveals rampant racism in decision-making software used by US hospitals – and highlights ways to correct it.

Heidi Ledford



Source: [Nature, 24 October 2019](#)

Background

- A set of algorithms was adopted by hospitals to manage care for 200 million people in the US each year
- It refers patients with complex medical needs to programmes that aim to improve care

Researchers spotted that:

- Dark-skinned people were less likely to be referred to the personalised care programme
- Only 17.7% of patients that the algorithms assigned to receive extra care were dark-skinned

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Source: [Nature, 24 October 2019](#)

Reasons behind:

- The algorithms used “medical expenses” as an indicator to assess patients’ needs for healthcare services
- Light-skinned people tended to spend more on healthcare and incur more medical expenses
- Poorer dark-skinned people would be wrongly classified as less in need for healthcare services

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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](#))



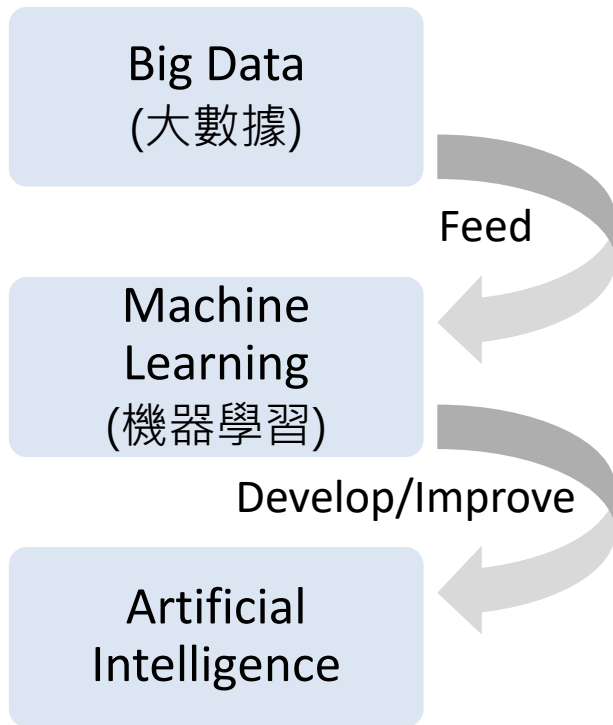
- Amazon's AI recruitment programme favoured male candidates due to its male-dominated training data (Source: [The Guardian, 11 Oct 2018](#))

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



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



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 (環球私隱議會):

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 (歐盟委員會):

Ethics Guidelines for Trustworthy AI



MAY 2019
OECD (經濟合作與發展組織):

Recommendation of the Council on Artificial Intelligence



SEP 2020
UNESCO (聯合國教科文組織):

First Draft of the Recommendation on the Ethics of Artificial Intelligence



OCT 2020
Global Privacy Assembly (環球私隱議會):

Resolution on Accountability in the Development and Use of AI



APR 2021
European Commission (歐盟委員會):

Proposal for a Regulation Laying Down Harmonised Rules on Artificial Intelligence



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OBJECTIVES

1. To provide guidance to enable organisations to develop and use AI in compliance with the requirements under the 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 (創科中心) and world-class smart city (智慧城市)



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3 Data Stewardship Values (數據管理價值)

**Being
RESPECTFUL**
(尊重)

to the rights, interests
and reasonable
expectations of
stakeholders

**Being
BENEFICIAL**
(互惠)

by providing benefits
and minimising harm
to stakeholders

Being FAIR
(公平)

by avoiding bias and
discrimination

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7 Ethical Principles for AI (人工智能的道德原則)



1. ACCOUNTABILITY (問責)

Organisations should:

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



2. HUMAN OVERSIGHT (人為監督)

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 (人工智能的道德原則)



3. TRANSPARENCY & INTERPRETABILITY (透明度與可解釋性)

Organisations should:

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



4. DATA PRIVACY (數據私隱)

Organisations should:

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

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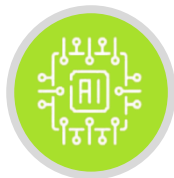
7 Ethical Principles for AI (人工智能的道德原則)



5. FAIRNESS (公平)

Organisations should:

- Avoid bias and discrimination in the use of AI



6. BENEFICIAL AI (有益的人工智能)

The use of AI should:

- Provide benefits
- Minimise harm to stakeholders



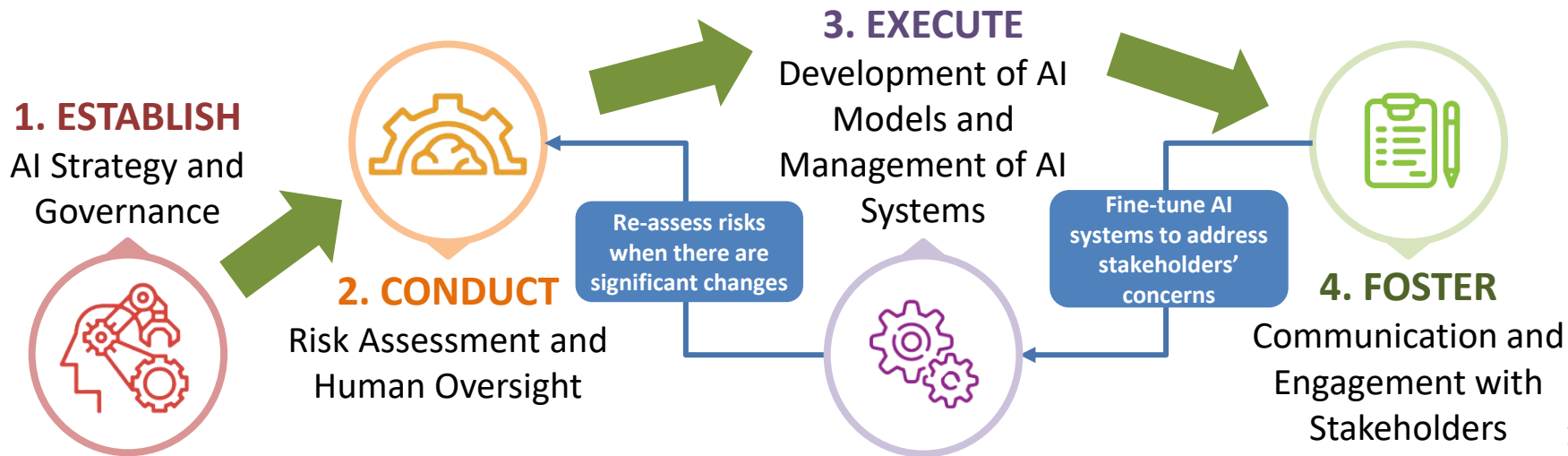
7. RELIABILITY, ROBUSTNESS & SECURITY (可靠、穩健及安全)

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



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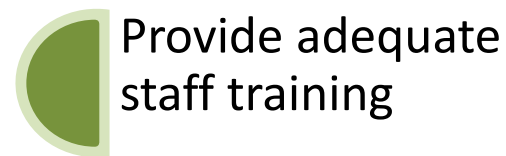
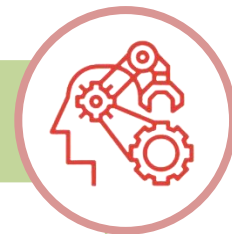
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1 of 4: ESTABLISH AI Strategy and Governance (人工智能策略及管治)



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2 of 4: CONDUCT Risk Assessment and Human Oversight
(風險評估及人為監督)

STEP 1: Conduct a comprehensive and early risk assessment

STEP 2: Take a risk-based (風險為本) approach to adopting appropriate risk mitigation measures

STEP 3: Determine appropriate level of human oversight

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2 of 4: CONDUCT Risk Assessment and Human Oversight (風險評估及人為監督)



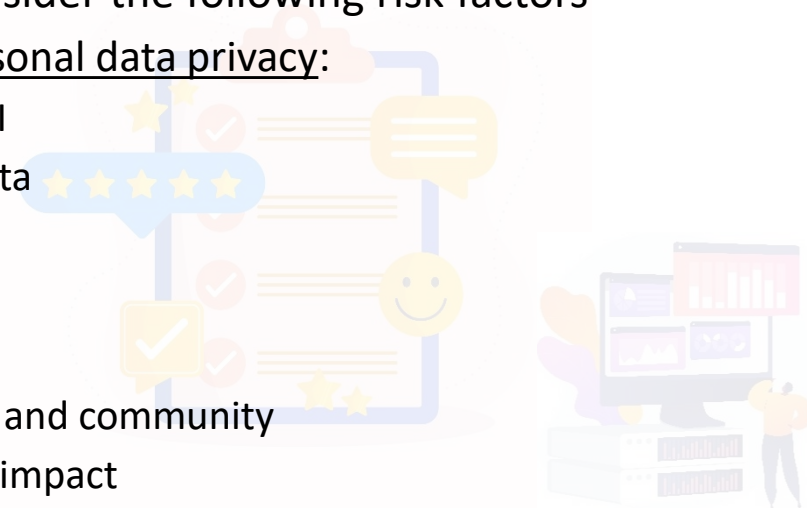
When conducting a risk assessment, consider the following risk factors -

From the perspective of protecting personal data privacy:

- Allowable uses of training data for AI
- Volume, sensitivity and quality of data
- Security of data
- Probability of privacy risks

From a wider ethical perspective:

- Potential impact of AI on individuals and community
- Probability, severity and duration of impact
- Adequacy of mitigation measures



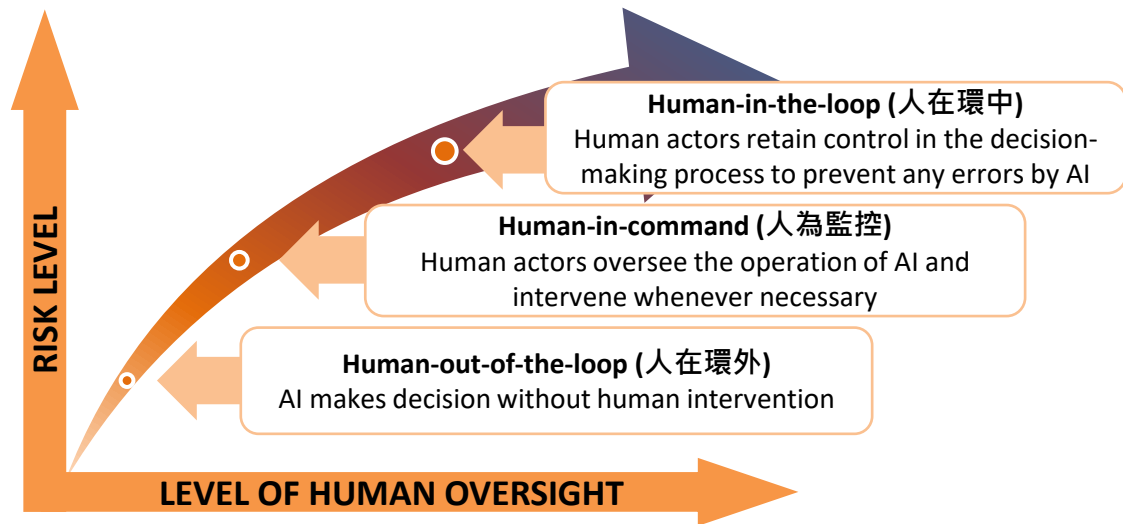
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2 of 4: CONDUCT Risk Assessment and Human Oversight (風險評估及人為監督)



After assessing the risk:

- Adopt the risk-based approach to human oversight-



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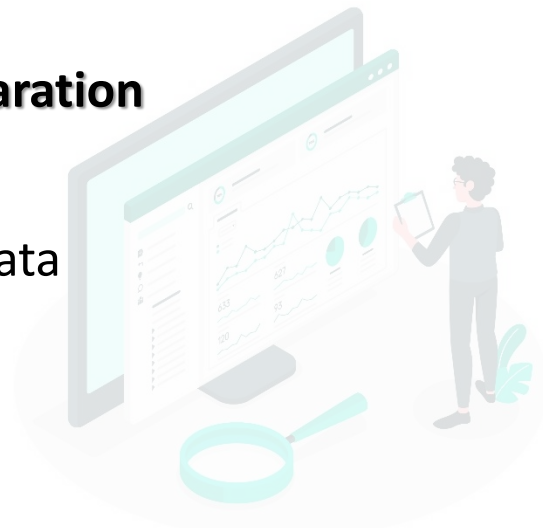
3 of 4: EXECUTE Development of AI Models and Management of AI Systems (開發人工智能模型及系統管理)



STAGE 1: Data Preparation

When preparing data for AI models:

- a) Ensure quality and lawful use of data
- b) Minimise the use of personal data



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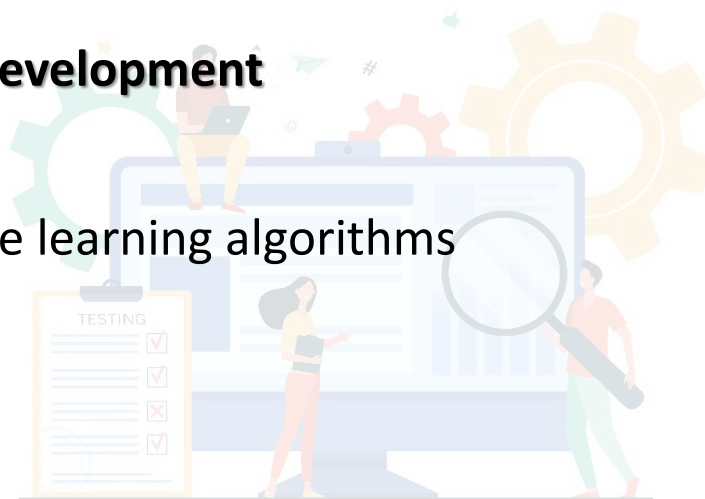
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STAGE 2: Model Development

When developing AI models:

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



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STAGE 3: Ongoing Monitoring and Management

When monitoring and managing AI models:

- a) Keep proper documentation
- b) Re-assess risks when there are significant changes
- c) Review periodically, tune and re-train AI
- d) Conduct human oversight
- e) Maintain robust security measures
- f) Provide user support and feedback channels
- g) Conduct evaluation and adjustments of AI strategy



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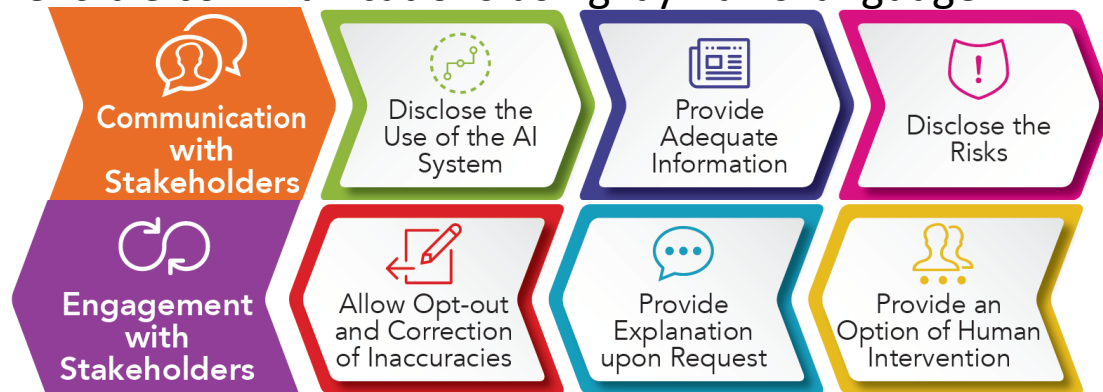
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4 of 4: FOSTER Communication and Engagement with Stakeholders (與持份者的溝通及交流)



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



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Thank you!

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