# AI and Information & Communication Technology: A Short Discussion

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# Open Problems

## Role of AI

- What is the main role of AI in the ICT in the future?
- How to ensure that AI is secure, unbiased and beneficial to society?

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### Theoretical Foundations

- What are the mathematical and computational foundations of AI?
   Can we prove theoretically and rigorously how AI works?
- How can we make sure that AI tools are transparent and explainable in their applications?

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## Green AI and Trustworthy AI

- How do we ensure that Al applications are green and sustainable?
- How to make sure that any developed AI systems in the future are trustworthy?

Future research should focus on addressing these challenging issues.

Now your chance to contribute to steer future AI directions  $\implies$  next page (Call for AI Articles)

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## Call for Articles for Elsevier's AI Encyclopedia (to be published in 2026)

As a section editor for *Encyclopedia of Artificial Intelligence: Foundations, Innovations & Future Directions* (i.e., Elsevier's "AI Encyclopedia" for short), I welcome articles in the following four areas:

- Introduction to AI
  - Definitions and scope of AI, social impact of AI
  - Al paradigms and approaches, Al and cognitive computing
  - Evolution of AI technologies and other topics
- 2 AI Foundations and Core Technologies
  - Machine learning algorithms and deep learning
  - Nature language processing and symbolic AI
  - Probabilistic reasoning models, algorithms and optimization
  - Al architecture and objective-driven Al as well as other topics
- 3 Al-Driven Innovation and Future Technology Pathways
  - Next-generation AI hardware, Edge AI and decentralized AI
  - Quantum computing in AI evolution
  - Al in synthetic biology, genomics, manufacturing, ICT, and cybersecurity systems. Any other suitable topics
- 4 Advanced Theoretical Concepts
  - Theoretical Foundations of learning, AI and generalization
  - Evolutionary AI, swarm AI and multi-agent AI systems
  - Causal inference in Al. quantum computing paradigms
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     Any other topics related to Al

Welcome your contribution to influence AI research directions

Xin-She Yang, Section Editor for Elsevier's AI Encyclopedia

Please email me your article proposal (article title, abstract) by 28 Feb 2025 email: x.yang@mdx.ac.uk

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