

Yingbo LI, Zhao LI, Yucong DUAN, Anamaria-Beatrice SPULBER,
2023. Physical artificial intelligence (PAI): the next-generation artificial
intelligence. *Frontiers of Information Technology & Electronic
Engineering*, 24(8):1231-1238. <https://doi.org/10.1631/FITEE.2200675>

Physical artificial intelligence (PAI): the next-generation artificial intelligence

Corresponding author: Yucong DUAN

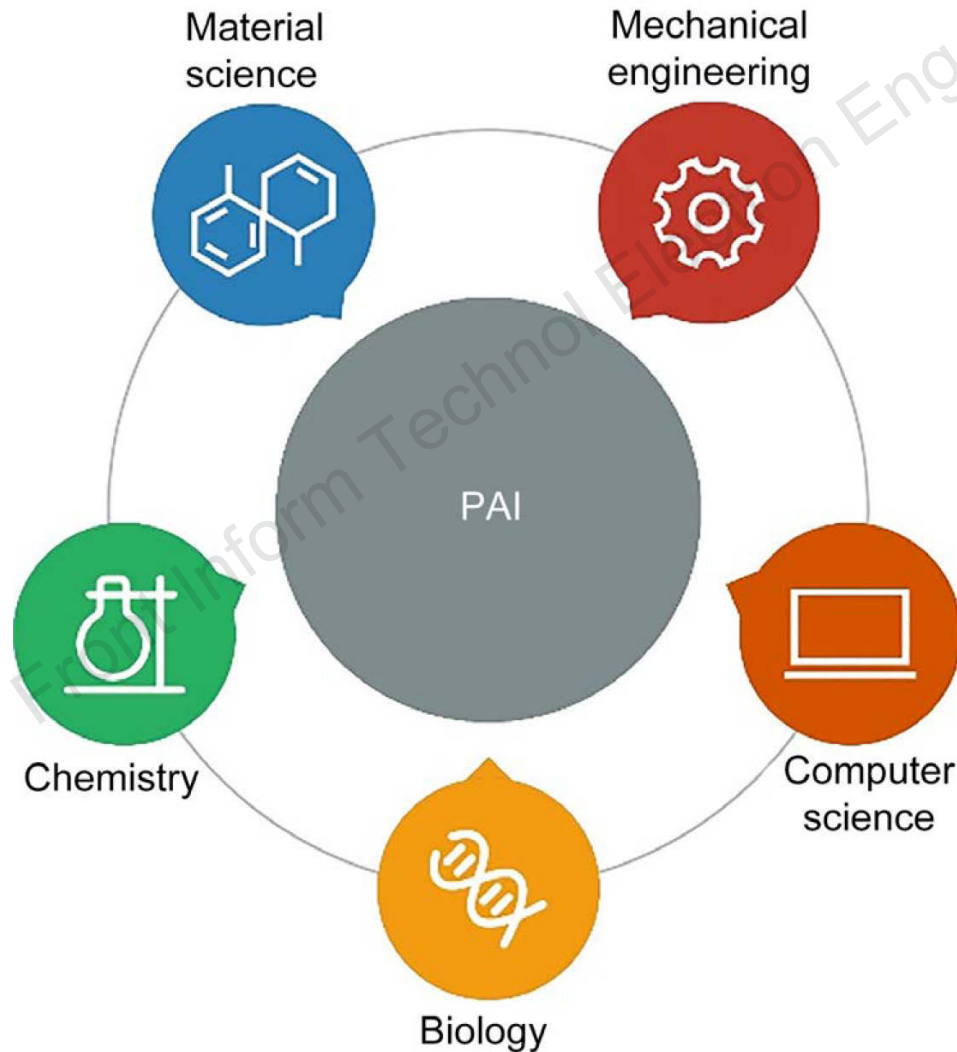
E-mail: duanyucong@hotmail.com

 ORCID: <https://orcid.org/0000-0001-8417-892X>

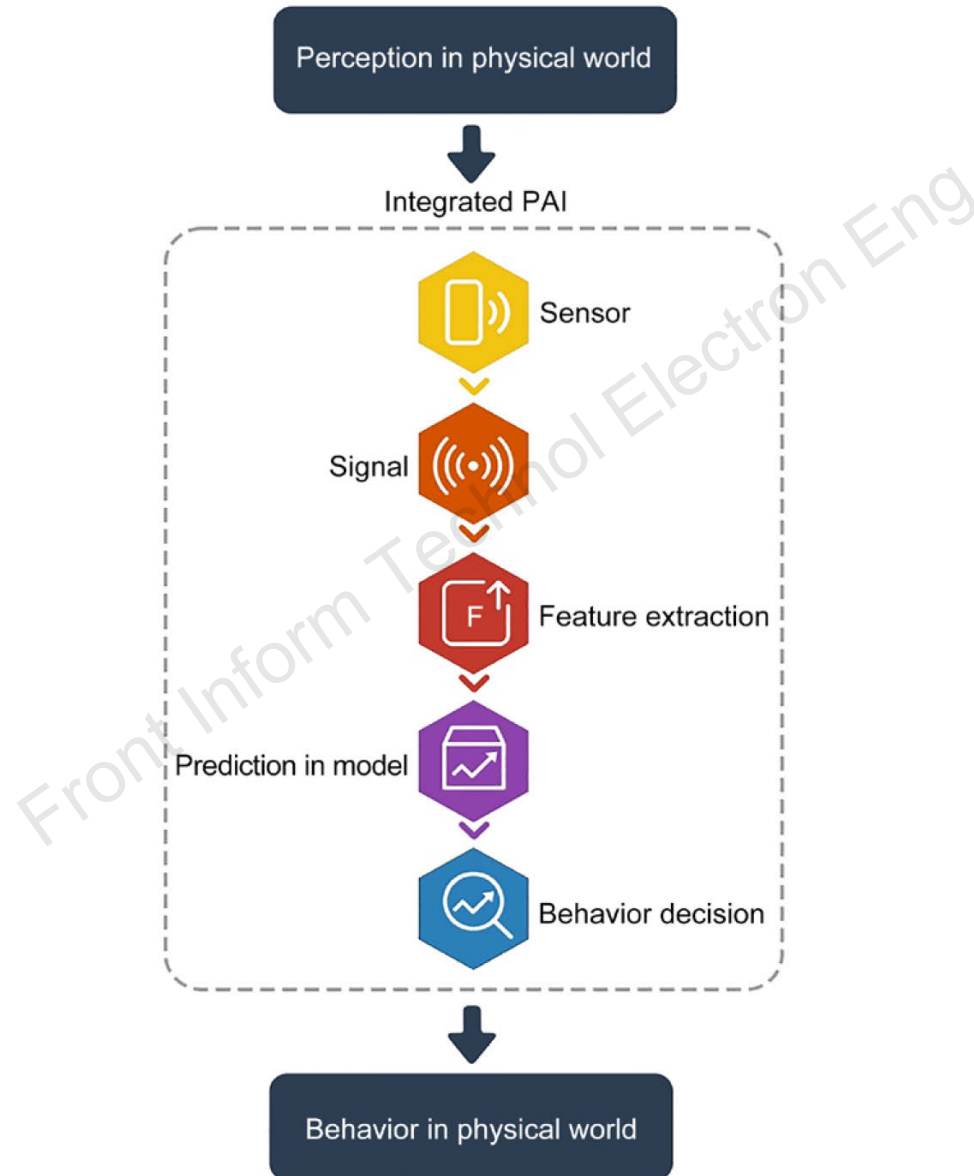
Motivation

1. The notion of **physical artificial intelligence (PAI)** has widely extended the theoretical foundation of artificial intelligence (AI).
2. We explore the concept of PAI and propose two subdomains: **integrated PAI (IPAI)** and **distributed PAI (DPAI)**.
3. We demonstrate the **potential development** of PAI as the **next-generation AI** and expected to inspire more **research and application** of PAI.

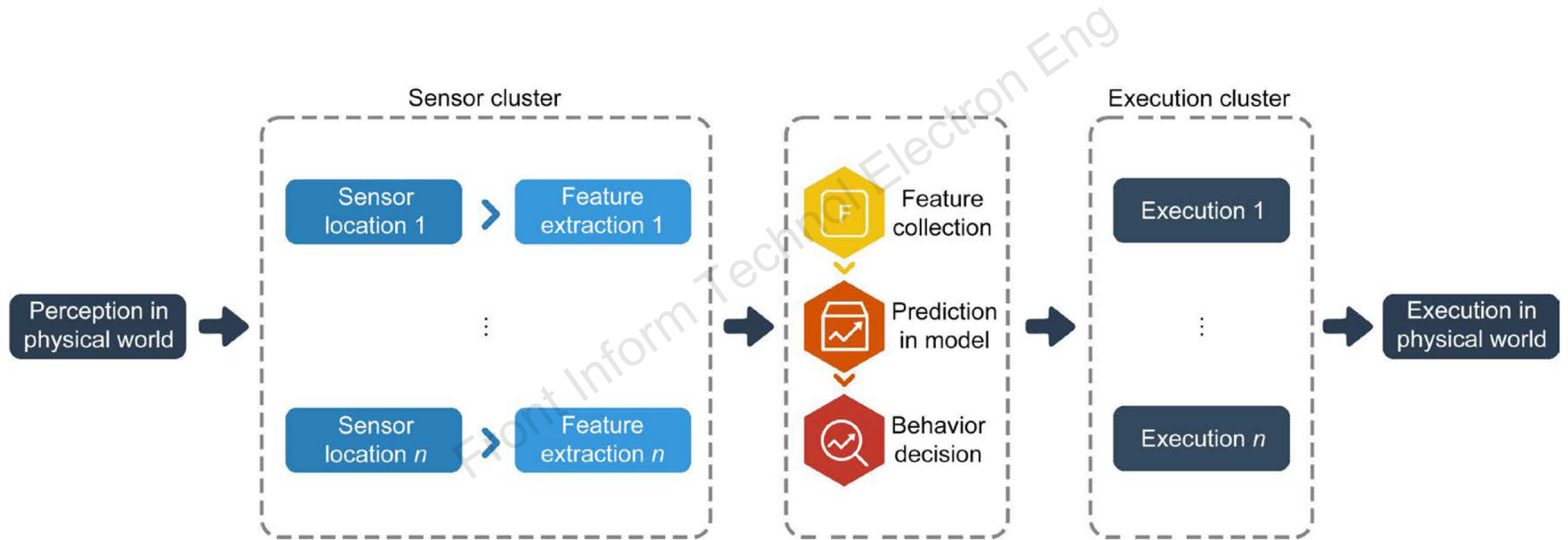
The concept of PAI



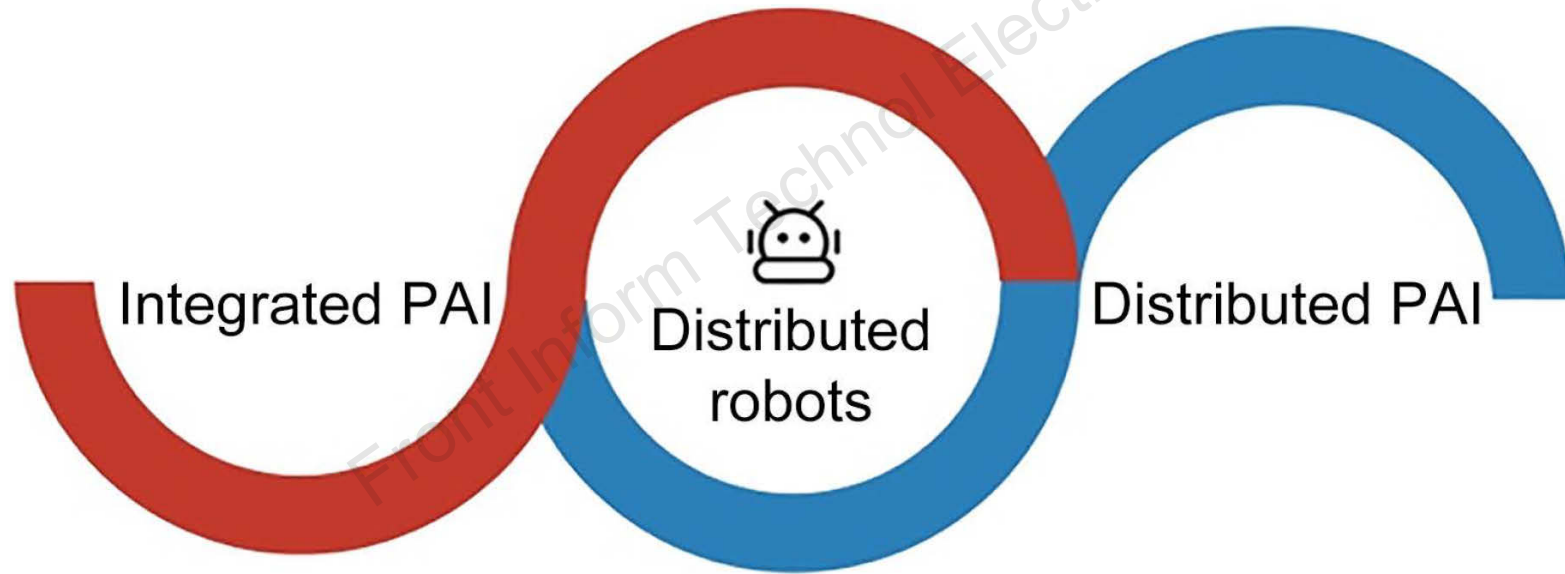
Integrated PAI



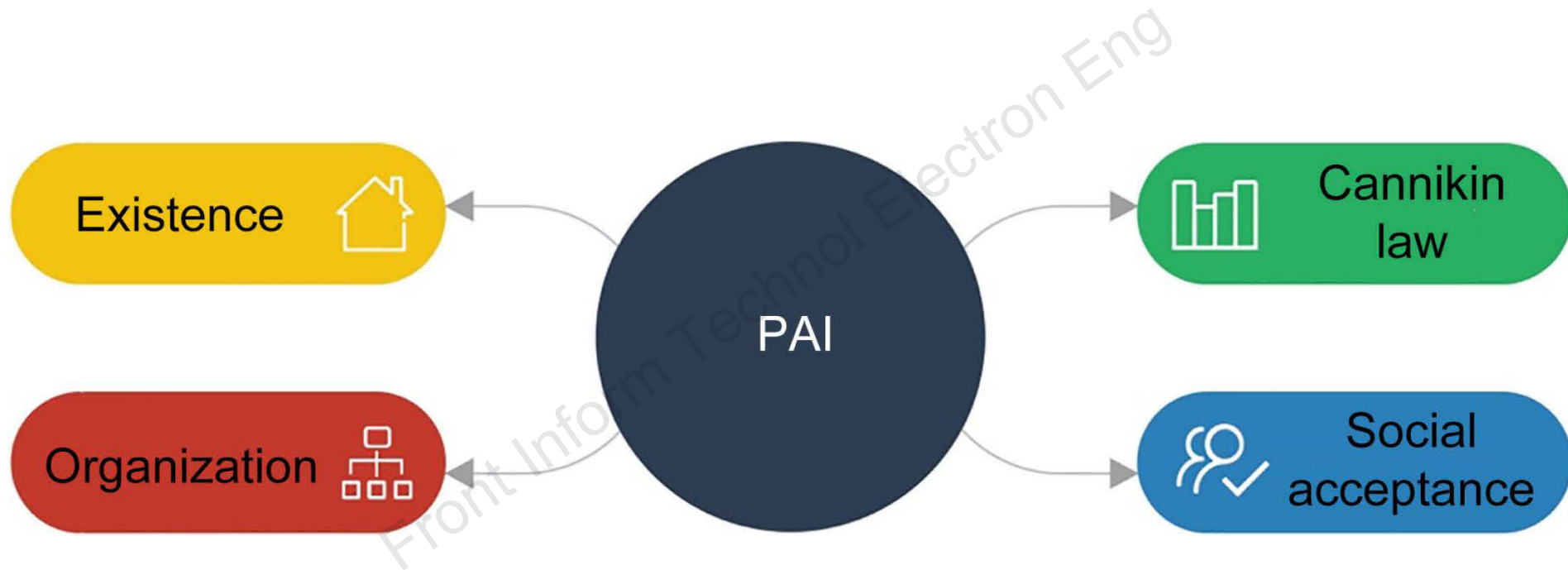
Distributed PAI



Integrated PAI and distributed PAI



PAI governance problems



Conclusions

1. We have discussed the **applications** of integrated PAI and distributed PAI.
2. We have explored the **trend** of PAI.
3. We have investigated the potential problems of **PAI governance and sustainable development**.



Yingbo LI received his BS degree from Xi'an Jiaotong University, China, MS degree from Pohang University of Science and Technology, Republic of Korea, and PhD degree from Polytechnic Institute of Paris, France. He also did the post-doctoral research at Dublin City University, France National Research Institute for Agriculture, Food and the Environment, and Ecole Normale Supérieure Paris. He is the active contributor of academics with the review of more than 100 papers in world prestigious journals and conferences. He is also the associate editor of *Applied AI Letters* and several other journals.



Yucong DUAN is a professor in the College of Computer Science, Hainan University, China. He received his PhD degree in software engineering from Institute of Software, Chinese Academy of Sciences, China, in 2006. He was a post-doctoral fellow in the School of Software, Tsinghua University, Pohang University of Science and Technology, Le2i of CNRS, DISCO of University of Milano Bicocca. He is a senior member of CCF and a senior member of IEEE. He has published more than 180 journal or conference papers with over 4000 citations by Google Scholar, and applied more than 240 Chinese and international patents with 85 authorized. His research interests include artificial intelligence, privacy and security, artificial consciousness, DIKWP, software engineering, etc.