

# Exploration and Research on Undergraduate Education for Artificial Intelligence Talent

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## Abstract

Artificial intelligence (AI) is not only a strategic technology shaping the future but also the core driver of a new wave of industrial revolution, a new focal point of international competition, and a new engine of economic development. It occupies a crucial role in national science and technology planning. With the rapid development and widespread application of AI technologies, the demand for professionals in the AI field is increasing rapidly. Therefore, talent cultivation has become one of the key factors driving the development of the AI field. However, there are several issues in the current undergraduate talent cultivation, including mismatched curriculum with practical needs, insufficient practical opportunities, and a lack of deep collaboration with industries. To address these challenges, this paper proposes several improvement strategies, including optimizing curriculum design to enhance practicality, strengthening university-industry collaboration to foster practical skill development, implementing mentorship programs for personalized student guidance, and promoting international exchanges and collaborations to broaden students' international perspectives. These improvement measures are expected to enhance students' comprehensive qualities and innovation capabilities, providing robust support for the sustainable development of the AI industry.

## Keywords

Artificial Intelligence, Talent Cultivation, Curriculum Design, Education Reform, Practical Skill Development.

## 1. Introduction

Artificial Intelligence (AI), as a crucial technology influencing national competitiveness and economic development, is increasingly becoming the core driver of technological innovation and industrial transformation worldwide[1]. Its significance extends beyond shaping future national strategic technologies to playing a central role in the ongoing industrial revolution. As a major force driving the Fourth Industrial Revolution, AI holds immense potential in catalyzing societal, economic, and cultural transformations.

The importance of AI manifests in several aspects[2]. Firstly, AI development holds significant implications for enhancing productivity, optimizing resource allocation, and improving living standards. The application of intelligent technologies enables automation and intelligence in production processes, thereby enhancing efficiency and quality. Secondly, AI applications in fields such as healthcare, education, transportation, finance, among others, promise to provide society with more intelligent and convenient services, driving industry upgrades and innovations. Additionally, AI also serves critical missions in national security, defense, and social stability, playing a pivotal role in safeguarding national interests and maintaining social order.

Against this backdrop, the urgency and importance of cultivating AI talent are evident. Professionals in the AI field require not only solid foundational knowledge in mathematics and

computer science but also interdisciplinary capabilities to apply technology to practical problem-solving, coupled with innovation and leadership skills[3]. However, the current talent cultivation models in higher education institutions suffer from a mismatch with industry demands. Traditional classroom teaching methods struggle to meet the diverse and complex needs of the AI field, lacking practical and project-oriented training approaches. Hence, there is a need to strengthen industry-academia collaboration, establish more flexible, open, and practical talent cultivation mechanisms to nurture high-quality talent adaptable to the needs of AI industry development.

Currently, the global demand for AI talent is growing rapidly, yet talent supply remains insufficient[4]. Particularly in the forefront AI technology fields and interdisciplinary applications, high-level talent is scarce. Therefore, enhancing AI talent cultivation has become a crucial strategic task for countries worldwide. As an active participant and promoter in the AI field, China attaches great importance to talent cultivation. A series of policy documents and planning initiatives have been introduced to provide policy support and guidance for AI talent cultivation.

In conclusion, the importance and urgency of AI talent cultivation cannot be overstated. Only by continuously improving the education system, strengthening industry-academia-research cooperation, expanding international collaboration, and nurturing a cadre of high-level talent with both theoretical foundations and practical capabilities and innovation awareness, can we meet the needs of AI industry development and propel continuous progress in national technological innovation and socioeconomic development.

## **2. Current Status Analysis of Artificial Intelligence Talent Cultivation**

### **2.1. Empowering Industries with Artificial Intelligence Talent**

The demand for and application of artificial intelligence (AI) talent in the industry exhibit characteristics of diversity, sustainability, and trends[5]. With the continuous development of AI technology and the expansion of application scenarios, the industry's demand for AI talent is growing, providing both vast opportunities and challenges for talent cultivation and industry development.

#### **(1) Broad Demand**

The demand for AI talent in the industry spans across various sectors and domains, including but not limited to finance, healthcare, manufacturing, retail, transportation, and education. Both traditional and emerging industries require the support and application of AI talent.

#### **(2) Demand for High-End Talent**

As AI technology continues to advance and application scenarios expand, the industry's demand for high-end AI talent with profound theoretical foundations and practical experience is increasing. These talents include algorithm engineers, data scientists, machine learning experts, etc., capable of addressing complex technical issues and challenges.

#### **(3) Demand for Composite Talent**

The industry's demand for composite talents who excel in both technical research and development and possess industry application experience and business insights is gradually increasing. These talents can integrate AI technology with industry demands to create more valuable solutions and products.

#### **(4) Continuous Demand**

Due to the continuous development of AI technology and the ongoing expansion of application scenarios, the industry's demand for AI talent will continue to grow. AI talent will play an important role in various aspects such as data analysis, intelligent decision-making, automated production, and intelligent customer service.

## (5) Diverse Application Scenarios

In the industry, AI technology is widely applied in data analysis and forecasting, intelligent manufacturing, personalized recommendations, financial risk control, intelligent healthcare, and other areas. Whether it is improving production efficiency, reducing costs, enhancing user experience, or improving service quality, AI technology plays a significant role.

## 2.2. Analysis of Education in Artificial Intelligence Internationally

Countries worldwide place significant emphasis on cultivating undergraduate talents in artificial intelligence (AI), striving for leadership positions in the fiercely competitive global tech landscape. The following is a detailed analysis of the undergraduate AI education situation in major countries internationally:

### (1) United States:

The United States holds a leading position in AI education globally, boasting numerous top-tier universities and research institutions. Institutions like Stanford University, Massachusetts Institute of Technology (MIT), and University of California, Berkeley, possess world-class research capabilities in AI[6]. These institutions offer students a wide range of AI courses covering comprehensive content from fundamental theories to cutting-edge technologies.

**Government Support:** The U.S. government has been dedicated to promoting AI education and research through policy formulation and funding. Since 2016, the government has issued a series of strategic documents on AI development and talent cultivation, including the "National Artificial Intelligence Research and Development Strategic Plan," aiming to encourage higher education institutions to enhance teaching and research in AI.

**Higher Education:** The U.S. boasts world-class universities and research institutions, many of which offer undergraduate courses and programs in AI. For example, institutions like Stanford University, MIT, and UC Berkeley have made remarkable achievements in AI research and education. Additionally, the U.S. encourages interdisciplinary collaboration, integrating AI technology with other disciplines to cultivate more comprehensive and diverse talents.

**Industry-Academia Collaboration:** Close collaboration exists between U.S. higher education institutions and technology companies. Tech giants like Google, Facebook, and Amazon frequently collaborate with universities to conduct AI research projects, providing internship opportunities and funding, thus offering students practical experience and employment opportunities.

**Innovation Ecosystem:** The U.S. has a thriving innovation ecosystem, including incubators, accelerators, and technology parks. These ecosystems provide an excellent entrepreneurial environment for students and startups, fostering innovation awareness and entrepreneurial spirit.

### (2) United Kingdom:

The UK also maintains a high level of expertise and reputation in AI education. Universities such as the University of Oxford, the University of Cambridge, and University College London have rich research experience and professional knowledge in AI[7]. These institutions offer students comprehensive and in-depth AI courses covering various fields and aspects.

**Government Support:** The UK government is committed to promoting AI technology development and talent cultivation through various policy documents and strategic plans, such as "Developing AI in the UK" and "AI Roadmap," actively driving talent cultivation and innovation development.

**Higher Education:** The UK possesses a wealth of teaching and research resources in AI. Renowned universities like Oxford and Cambridge offer undergraduate courses and programs in AI, providing students with high-quality education and training.

**Industry-Academia Collaboration:** The UK's higher education institutions maintain close collaboration with technology companies. For example, the UK government collaborates with the industry to establish the AI Industry Association, promoting industry-academia collaboration and advancing the commercialization and application of AI technology.

**Innovation Ecosystem:** The UK has many innovation centers and technology parks, such as London Tech City and Manchester Innovation District, providing excellent development platforms and resource support for AI entrepreneurs and startups.

### (3) Japan:

Japan also possesses considerable research capabilities and industrial strength in the field of AI. Universities like the University of Tokyo, Kyoto University, and Tokyo Institute of Technology have conducted a series of research projects and collaborative activities in AI[8]. Undergraduate AI education in Japan emphasizes the integration of theory and practice, exposing students to the latest AI theories and technologies and providing opportunities to participate in related research and innovation activities.

**Government Support:** The Japanese government attaches great importance to AI technology development and talent cultivation, issuing a series of policy documents such as the "AI Technology Strategy" to promote AI technology research and talent cultivation.

**Higher Education:** Japanese universities also have rich teaching and research resources in AI. Renowned universities like the University of Tokyo and Kyoto University offer undergraduate courses and programs in AI, providing students with high-quality education and training.

**Industry-Academia Collaboration:** Japan's higher education institutions maintain close collaboration with technology companies. Companies like Toyota, Honda, and Sony frequently collaborate with universities to conduct AI research projects, providing internship opportunities and funding for students, thus offering practical experience and employment opportunities.

**Innovation Ecosystem:** Japan has many innovation centers and technology parks, such as the Tokyo Innovation Center and Kyoto Science Park, providing excellent development platforms and resource support for AI entrepreneurs and startups.

### (4) Germany:

Germany also possesses certain strength and potential in the field of AI. Universities and research institutions like the Technical University of Berlin, Technical University of Munich, and Max Planck Institute have achieved a series of research results and breakthroughs in AI[9]. Undergraduate AI education in Germany emphasizes the integration of theory and practice, exposing students to the latest AI theories and technologies and providing opportunities to participate in related research and innovation activities.

**Government Support:** The German government is committed to promoting AI technology development and talent cultivation through various policy documents and strategic plans, such as the "AI Strategy," actively driving talent cultivation and innovation development.

**Higher Education:** German universities also have rich teaching and research resources in AI. Renowned universities like the Technical University of Munich and the Technical University of Berlin offer undergraduate courses and programs in AI, providing students with high-quality education and training.

**Industry-Academia Collaboration:** Germany's higher education institutions maintain close collaboration with technology companies. Companies like Volkswagen, BMW, and Siemens frequently collaborate with universities to conduct AI research projects, providing internship opportunities and funding for students, thus offering practical experience and employment opportunities.

**Innovation Ecosystem:** Germany has many innovation centers and technology parks, such as the Berlin Technology Park and Munich Technology Park, providing excellent development platforms and resource support for AI entrepreneurs and startups.

(5) Canada:

Canada holds a leading position in AI education globally. Canadian universities have world-class research capabilities in AI, especially in areas like deep learning, machine learning, and natural language processing[10]. Universities like the University of Toronto, McGill University, and the University of Alberta are renowned institutions in the field of AI. These universities offer students a diverse range of AI courses covering comprehensive content from fundamental theories to cutting-edge technologies.

**Government Support:** The Canadian government attaches great importance to AI technology development, actively promoting talent cultivation and innovation development through a series of policy measures and funding support, such as the "AI Strategy."

**Higher Education:** Canadian universities also have rich teaching and research resources in AI. Renowned universities like McGill University and the University of Toronto offer undergraduate courses and programs in AI, providing students with high-quality education and training.

**Industry-Academia Collaboration:** Canadian higher education institutions maintain close collaboration with technology companies. Companies like Google Brain and DeepMind often collaborate with universities to conduct AI research projects, providing internship opportunities and funding for students, thus offering practical experience and employment opportunities.

**Innovation Ecosystem:** Canada has many innovation centers and technology parks, such as the Montreal Technology Park and the Toronto Technology Park, providing excellent development platforms and resource support for AI entrepreneurs and startups.

(6) Australia:

Australia also possesses certain strength and potential in the field of AI. Universities like the University of Melbourne and the University of Sydney have conducted a series of research projects and collaborative activities in AI[11]. Undergraduate AI education in Australia emphasizes the integration of theory and practice, exposing students to the latest AI theories and technologies and providing opportunities to participate in related research and innovation activities.

**Government Support:** The Australian government is committed to promoting AI technology development and talent cultivation through various policy documents and strategic plans, such as the "AI Development Strategy," actively driving talent cultivation and innovation development.

**Higher Education:** Australian universities also have rich teaching and research resources in AI. Renowned universities like the University of Sydney and the University of Melbourne offer undergraduate courses and programs in AI, providing students with high-quality education and training.

**Industry-Academia Collaboration:** Australian higher education institutions maintain close collaboration with technology companies. Companies like Atlassian and Canva frequently collaborate with universities to conduct AI research projects, providing internship opportunities and funding for students, thus offering practical experience and employment opportunities.

**Innovation Ecosystem:** Australia has many innovation centers and technology parks, such as the Sydney Technology Park and the Melbourne Technology Park, providing excellent development platforms and resource support for AI entrepreneurs and startups.

### (7) Singapore:

Singapore has also achieved certain achievements in the field of AI, especially in robotics and automation. Singapore's National University of Singapore (NUS) and Nanyang Technological University (NTU) have high academic standards and research capabilities in AI[12]. Undergraduate AI education in Singapore emphasizes the integration of theory and practice, exposing students to the latest AI theories and technologies and providing opportunities to participate in related research and innovation activities.

**Government Support:** The Singaporean government attaches great importance to AI technology development, actively promoting talent cultivation and innovation development through a series of policy documents and strategic plans, such as the "Smart Nation: Singapore AI Strategy."

**Higher Education:** Singaporean universities also have rich teaching and research resources in AI. Renowned universities like NUS and NTU offer undergraduate courses and programs in AI, providing students with high-quality education and training.

**Industry-Academia Collaboration:** Singapore's higher education institutions maintain close collaboration with technology companies. Government agencies like the Singaporean Economic Development Board (EDB) and the Civil Aviation Authority of Singapore (CAAS), as well as companies like Google and Microsoft, often collaborate with universities to conduct AI research projects, providing internship opportunities and funding for students, thus offering practical experience and employment opportunities.

**Innovation Ecosystem:** Singapore has many innovation centers and technology parks, such as the Singapore Science Park and the Nanyang Technology Park, providing excellent development platforms and resource support for AI entrepreneurs and startups.

In conclusion, countries worldwide attach great importance to undergraduate talent cultivation in AI, providing rich educational resources for cultivating high-level AI talents. These countries have taken various measures in government support, higher education, industry-academia collaboration, and innovation ecosystems, jointly promoting the development and innovative application of AI technology.

## 2.3. Current Status of Education in Artificial Intelligence in China

Undergraduate education in artificial intelligence (AI) in China plays a crucial role in fostering technological innovation, driving industrial development, serving society, and enhancing international competitiveness, leading to significant achievements and contributions[13]. With the continuous development and improvement of China's AI industry, undergraduate AI education has achieved remarkable progress.

### (1) Educational System and Government Support:

**Educational System:** China boasts a vast and diverse higher education system, comprising numerous prestigious universities and research institutions. In the realm of undergraduate AI education, top-tier universities such as Tsinghua University, Peking University, Shanghai Jiao Tong University, and Wuhan University possess rich faculty resources and advanced teaching facilities, providing students with high-quality educational resources.

**Government Support:** The Chinese government highly prioritizes the development of AI technology, considering it a national strategic priority. Through a series of policy documents and strategic plans such as "Made in China 2025" and the "Next Generation Artificial Intelligence Development Plan," the Chinese government actively promotes talent cultivation and technological innovation, offering policy support and financial guarantees for undergraduate AI talent cultivation.

### (2) Curriculum Design and Teaching Quality:

**Curriculum Design:** The undergraduate AI curriculum in China covers a wide range of areas, including machine learning, deep learning, natural language processing, computer vision, and other core subjects. Additionally, it encompasses knowledge in data science, algorithm design, and intelligent systems, providing students with comprehensive learning opportunities.

**Teaching Quality:** As AI technology rapidly evolves, Chinese universities continuously improve teaching methods and content to meet industry demands. Some institutions incorporate international advanced teaching philosophies and methods, enhancing teaching quality and students' practical skills through project-based learning and practical course design.

### (3) Practical Opportunities and Research Projects:

**Practical Opportunities:** Close partnerships between Chinese universities and enterprises provide students with abundant internship and practical opportunities. Many renowned technology companies such as Tencent, Alibaba, and Baidu frequently collaborate with universities to conduct AI research projects, offering students opportunities to interact with industry experts and participate in real-world projects.

**Research Projects:** Chinese universities possess abundant research resources and projects in the field of AI. Students have the opportunity to participate in national and provincial research projects, conducting cutting-edge technology research with their mentors, thereby enhancing their research and innovation capabilities.

### (4) Innovation and Entrepreneurship Environment:

**Innovation Ecosystem:** China has established numerous science and technology parks and innovation centers, such as Zhongguancun in Beijing and Qianhai in Shenzhen, providing excellent development platforms and resource support for AI entrepreneurs. Students have the opportunity to immerse themselves in the entrepreneurial atmosphere during their studies, accumulating entrepreneurial experience and choosing entrepreneurship or employment upon graduation.

**Policy Support:** The Chinese government has introduced a series of policies supporting innovation and entrepreneurship, such as tax incentives and entrepreneurship guarantee loans, encouraging young talents to engage in innovation and entrepreneurship and promoting the commercial application and industrial development of AI technology.

### (5) International Exchange and Cooperation:

**International Cooperation:** Chinese universities actively participate in international cooperation and exchanges with top universities and research institutions worldwide, promoting talent cultivation and sharing research achievements. Additionally, Chinese undergraduate AI students have the opportunity to participate in overseas exchange programs, expanding their international perspectives and enhancing global competitiveness.

China has made significant progress in undergraduate AI talent cultivation, possessing abundant educational resources, excellent teaching quality, and diverse practical opportunities. With the continuous improvement of government support policies and the further enhancement of the innovation and entrepreneurship environment, it is believed that China will continue to cultivate more outstanding AI talents, making greater contributions to the innovation and development of AI technology.

## 2.4. Challenges in the Talent Cultivation Model for Artificial Intelligence

Currently, universities bear the crucial responsibility for cultivating AI talents, while enterprises also make significant contributions. Undoubtedly, in recent years, the quantity and quality of AI talent cultivation have significantly improved. However, the existing model still faces several issues:

### (1) Unreasonable Curriculum Design:

Lack of cutting-edge and practical course content, such as courses focusing on popular technologies like deep learning and reinforcement learning.

Insufficient practical courses integrated with real-world application scenarios, hindering students' understanding and mastery of core AI technologies and problem-solving abilities.

(2) Insufficient Teaching Resources:

Inadequate teaching resources in the AI field, including textbooks, laboratory facilities, and hardware equipment.

Difficulty in keeping up with the rapid technological advancements due to the high costs associated with updating resources, resulting in students' limited exposure to the latest teaching materials and hindering their learning experiences and practical abilities.

(3) Shortage of Teaching Staff:

The scarcity of faculty members in the AI field with profound theoretical knowledge and rich practical experience.

Many schools struggle to meet the demand for teachers with solid expertise and experience in AI, leading to disparities in teaching quality.

(4) Inadequate Practical Components:

Traditional AI courses often lack practical components, limiting students' exposure to theoretical knowledge without sufficient opportunities for hands-on experience and project-based learning.

The absence of practical elements hampers students' ability to apply theoretical knowledge to real-world problem-solving and impedes the development of practical application and innovation skills.

(5) Insufficient Integration of Interdisciplinary Knowledge:

AI encompasses various disciplines such as mathematics, computer science, and engineering, yet there is insufficient integration of interdisciplinary knowledge in curriculum design and teaching practices.

This limited integration results in students' superficial understanding of AI technologies, lacking in-depth knowledge of underlying principles and theories, thereby affecting their comprehensive and applied capabilities.

(6) Disconnection Between Industry Demands and Educational Institutions:

The rapid development of the AI field often surpasses the adaptability of educational systems, leading to mismatches between school curricula and industry demands.

The discrepancy between educational offerings and industry requirements exacerbates students' challenges in matching their skills with market demands upon graduation.

(7) Lack of International Perspectives:

Despite AI being a global field, some educational institutions lack international perspectives in talent cultivation.

Limited exposure to international teaching resources and curriculum content restricts students' international competitiveness, as the educational focus remains predominantly domestic.

These challenges highlight the need for comprehensive reforms in AI talent cultivation to address curriculum deficiencies, enhance teaching resources, develop faculty expertise, incorporate practical components, integrate interdisciplinary knowledge, align with industry demands, and promote internationalization. Addressing these issues will contribute to the production of highly skilled AI professionals capable of meeting the demands of the rapidly evolving AI landscape.



## 2.5. Insights from World-Class Universities' Undergraduate AI Talent Cultivation and Their Implications for China

World-class universities have accumulated rich experience in undergraduate AI talent cultivation, which holds significant insights and reference value for China's AI undergraduate talent cultivation. The following is a comprehensive summary and analysis of the insights from world-class universities' undergraduate AI talent cultivation for China:

### (1) Optimization of Curriculum Design and Teaching Content:

**Diversified Courses:** World-class universities emphasize diverse course offerings covering various AI domains such as machine learning, deep learning, computer vision, and natural language processing. China can adopt this approach to continuously optimize curriculum design, ensuring students grasp comprehensive core theories and technologies of AI.

**Practical Teaching:** World-class universities integrate theoretical knowledge with practical skills by offering hands-on experience through practical teaching and project-driven methods. China can increase practical courses and project opportunities to cultivate students' practical skills and innovative thinking.

### (2) Strengthening Faculty Development:

**Talent Attraction:** World-class universities attract top international talents, establishing high-level faculty teams. China can enhance the quality of AI undergraduate education and research capabilities by attracting international talents and outstanding scholars.

**Mentorship:** World-class universities value mentorship systems, providing personalized guidance and support to students. China can strengthen mentorship development, nurturing experienced mentors with high research and teaching standards to offer better academic guidance and career planning for students.

### (3) Promoting Industry-Academia Collaboration:

**Industry-Academia Cooperation:** World-class universities collaborate closely with industries to promote industry-academia collaboration, accelerate the transformation of research results, and facilitate technological applications. China can strengthen cooperation with enterprises and research institutions to promote industrialization and commercialization of AI technologies, enhancing the practicality and relevance of talent cultivation.

### (4) Enhancing Internationalization:

**International Exchange:** World-class universities actively engage in international exchanges and cooperation, expanding students' international perspectives and communication platforms. China can enhance collaboration with top international universities to elevate the internationalization of AI undergraduate education, attracting more international students and scholars for exchange and study.

**English Teaching:** World-class universities prioritize English teaching to provide an internationalized teaching environment and learning resources. China can enhance English education to improve the English proficiency of teachers and students, facilitating the alignment of AI undergraduate education with international standards.

### (5) Emphasizing Innovation and Entrepreneurship Education:

**Innovation and Entrepreneurship Atmosphere:** World-class universities advocate for innovation and entrepreneurship, offering platforms and resources to support students' innovation and entrepreneurship endeavors. China can strengthen innovation and entrepreneurship education to foster students' innovation capabilities and entrepreneurial awareness, promoting the innovative development and industrial transformation of AI technology.

In conclusion, the experience of world-class universities in undergraduate AI talent cultivation provides valuable insights and references for China. China can leverage their excellent

educational concepts and teaching models to continuously optimize undergraduate AI education, cultivate more high-quality AI talents, and propel the rapid development of China's AI industry while enhancing its international competitiveness.

### 3. Strategies for Improving Undergraduate AI Talent Cultivation

The 20th National Congress of the Communist Party of China proposed the strategic deployment of coordinating education, science and technology, and talent development, aiming to build an educationally strong nation by 2035. The cornerstone of this endeavor is higher education. The advancement of a strong higher education system is not only a historical responsibility entrusted by the times but also a new exploration in practice. As the core driving force of a new round of industrial revolution, artificial intelligence (AI) must adhere to the principle of serving the high-quality development of talents. Under the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, it is imperative to construct a high-quality AI education system that is tailored to Chinese characteristics, matches international standards, and aligns with the modernization of China. This will effectively promote the implementation of key tasks in building a strong education nation.

The cultivation of artificial intelligence (AI) talents necessitates adhering to the "three orientations" policy, which involves orienting towards the forefront of global technology, addressing national significant demands, and focusing on the key battlegrounds of the national economy. Consequently, a well-structured classification system for talent cultivation is imperative. Based on the directions of talent cultivation, three categories emerge: Firstly, cultivating applied talents emphasizes the integration of AI algorithms with specific industries, utilizing existing AI tools, and addressing specific problems according to contextual scenarios to achieve scalability and industrialization. Secondly, the cultivation of technical talents primarily focuses on innovating core algorithms, core concepts, and engaging in industrial research and development. Lastly, cultivating fundamental AI talents involves conducting foundational research and theoretical explorations in the AI domain to delve into the fundamental principles, models, and algorithms. Therefore, it is crucial to explore avenues for improving talent cultivation tailored to these three categories of talents.

#### 3.1. Cultivation of Applied Talents

##### (1) Optimization of Interdisciplinary Curriculum Design:

Establish bridges between interdisciplinary courses, guiding students from AI technology to specific industries, enabling them to deeply understand the characteristics and needs of different industries such as healthcare, finance, and retail.

Organize industry seminars and specialized lectures, inviting industry experts and corporate representatives to share the latest industry trends and practical experiences, broadening students' industry perspectives.

##### (2) Enhancement of Project-Driven Learning Practices:

Design challenging and practical project tasks, allowing students to solve complex problems in real scenarios through teamwork, thereby cultivating their problem-solving and teamwork abilities.

Introduce project evaluation and feedback mechanisms to provide timely assessment and guidance on students' project outcomes, encouraging them to continuously improve and optimize solutions.

##### (3) Strengthening Internships and Industry Collaboration:

Establish deep cooperative relationships with industry partners to conduct practical projects and research cooperation, allowing students to directly participate in real industry projects and enhance their practical capabilities and industry awareness.

Establish an industry mentorship system where experienced industry practitioners serve as mentors to provide one-on-one guidance and counseling to students, imparting industry experience and professional skills.

#### (4) Diversification of Case Studies and Practical Training:

Collect diverse industry cases and practical data, integrate them into classroom teaching and practical training, enabling students to analyze and solve practical problems from multiple perspectives, thus developing their analytical and problem-solving abilities.

Introduce real datasets and business scenarios, allowing students to engage in practical training in simulated environments, familiarizing them with industry workflows and data processing techniques.

### 3.2. Cultivation of Technical Talents

#### (1) Comprehensive Coverage of In-Depth Technical Courses:

Design a comprehensive technical curriculum system that gradually unfolds from basics to in-depth, covering various aspects such as machine learning, deep learning, computer vision, and natural language processing.

Introduce the latest research results and practical cases to showcase the application and development trends of cutting-edge technologies, stimulating students' interest in learning and exploration.

#### (2) Deepening Laboratory and Project Practices:

Establish advanced laboratories with state-of-the-art equipment and technical support, providing diverse experimental scenarios and project platforms to support students' scientific research and technological innovation.

Organize interdisciplinary team projects to enable students to learn and collaborate across disciplines, expanding the breadth and depth of technological applications.

#### (3) Incentive Mechanisms for Challenges and Competitions:

Design multiple levels of challenges and competition projects, including internal competitions within the school and domestic and international competitions, offering challenges of different difficulty levels and themes to meet the needs of students at various levels.

Provide substantial rewards and honors to attract outstanding students to participate in competitions, promoting their innovation and breakthroughs in the technical field.

#### (4) Strengthening Mentor Guidance and Personalized Development:

Establish a mentorship system comprising experienced technical mentors to provide personalized academic guidance and career planning counseling to students, assisting them in selecting suitable technical directions and development paths based on their interests and abilities.

Organize regular academic seminars and technical lectures for students to exchange experiences and insights with mentors and peers, broadening their academic perspectives and thinking modes.

### 3.3. Cultivation of Fundamental Talents

#### (1) Professional Setting of Cutting-Edge Research Courses:

Offer in-depth and systematic fundamental theory courses covering knowledge from multiple disciplines such as mathematics, statistics, and computer science, laying a solid theoretical foundation for students.

Introduce cutting-edge research topics and academic lectures to keep students informed of the latest research advances and academic frontiers, stimulating their interest and enthusiasm for research.

## (2) Support for Research Projects and Paper Publications:

Provide abundant research resources and experimental equipment to support students in conducting research projects and experimental studies, fostering their research capabilities and innovation awareness.

Encourage students to actively participate in academic conferences and journal submissions, cultivating their academic writing and communication skills, and promoting the output and exchange of research results.

## (3) Strengthening International Cooperation and Exchange:

Expand international academic exchange channels and actively participate in international academic cooperation projects and conferences, allowing students to engage in academic exchanges and collaborative research with top international scholars.

Provide opportunities for study abroad and exchanges, encouraging students to study and conduct research abroad to broaden their international perspectives and acquire cutting-edge research results and ideas.

## (4) Enhancement of Mentor Guidance and Mentorship System Cultivation:

Establish a mentorship system assigning professional mentors to provide one-on-one academic guidance and tracking management for students, helping them plan research directions and topics and resolve difficulties and confusion in research.

In summary, improving and enhancing AI talent cultivation requires comprehensive measures, including optimizing curriculum design, promoting project-driven learning, deepening industry collaboration, incentivizing competitions, and strengthening mentor guidance. These measures will help cultivate AI talents who are more comprehensive, in-depth, and possess practical abilities, meeting the diverse needs of talent cultivation at different levels and types.

## 4. Conclusion

Artificial intelligence (AI) stands as a pivotal engine driving contemporary global technological advancements, bearing immense societal and economic significance. Its applications across diverse domains such as healthcare, finance, transportation, and education have unleashed boundless possibilities, elevating productivity, enhancing living standards, and fostering societal progress. However, the robust development of AI technology is intrinsically linked to the reservoir and cultivation of talent, underscoring the paramount importance of undergraduate education in AI talent cultivation.

The importance of undergraduate education in AI talent cultivation is self-evident. Firstly, proficient AI professionals serve as critical catalysts for advancing AI technology and innovation. Their adept grasp of AI theory and technology enables practical application in real-world scenarios, thereby propelling the implementation and development of AI technology. Secondly, robust undergraduate education in AI is essential to ensuring the sustainable development of the AI industry. Through systematic undergraduate training, individuals equipped with a solid theoretical foundation, innovative capabilities, and practical skills can be cultivated, providing sustained talent support for the long-term development of the AI industry. Furthermore, for individual students, quality undergraduate education lays a solid foundation for their career development, offering broad employment opportunities and platforms for growth.

However, there are some deficiencies in the current undergraduate education in AI talent cultivation. On one hand, undergraduate education in AI lacks systematicity and specificity, with curriculum designs often failing to align closely with practical demands and lacking interdisciplinary integration. On the other hand, the talent cultivation mode remains relatively

traditional, lacking sufficient practical opportunities and industry collaborations, thereby necessitating improvements to enhance students' practical and applied capabilities.

To address the aforementioned issues, this paper proposes several improvement strategies, aiming to facilitate the development of AI talent cultivation. The exploration and research into undergraduate education in AI talent cultivation are significant yet complex tasks, requiring collaborative efforts from governments, universities, enterprises, and other stakeholders. Only through concerted endeavors can the continuous improvement and enhancement of the AI talent cultivation system be achieved, thereby effectively addressing the challenges and opportunities presented by the development of AI technology.

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