

# 1 Paper Overview

“A Berkeley View of Systems Challenges for AI”, written by Ion Stoica, Dawn Song, et al. from Berkeley, is now in arXiv. Given the increasingly sophisticated application environments of the AI system and the limitation of future data technology, this paper proposes several open research directions in system, architectures, and security to address the challenges for greater AI system deployment. It first summarizes the factors contributing to the success of AI, including massive data quantities, development of computing technology, and broad technical accessibility (open source and public infrastructures). As follows, considering the dynamic environments [3], security concerns and specific hardware requirements of AI system, this paper proposes possible research directions deriving from current development. In general, the contributions of this paper is as follows:

1. It gives summary about the successful factors and challenges of present AI systems in light of the data explosive era.
2. Based on challenges, it surveys and concludes possible research directions for those challenges.

## 1.1 Problem Summary

Present AI systems embrace successful development in decades, while there are some challenges for potential greater scale AI system deployment. Some open research directions in system, architectures, and security are proposed to address the challenges.

## 1.2 Related Works

- Lifelong machine learning systems: Beyond learning algorithms [2].
- Op-Ed: Call it Multiplicity: Diverse Groups of People and Machines Working Together [1].

# 2 Paper Strengths

The broad coverage of present AI systems concerns is the greatest strength of this paper. This paper gives a completed visionary of possible research directions, along with summary of present system challenges. It borrows ideas and comparison from related area such as robotics to give the possible solution directions for the mentioned challenges. It is definitely a good survey paper with multiple worthy system-wise visions.

1. It is insightful to see the possible trends of AI systems.
2. The background of this paper gives enough credibility for the research directions proposed.

# 3 Paper Weaknesses

As a survey paper for such emergent and broad area, the depth and length of this paper is not enough. Although it surveys the present challenges and proposes the potential research directions, the coverage of present solutions seems to be insufficient. Moreover, since there are both engineering and academic concerns in AI system, this paper might require more concerns about the engineering level. The main weakness of this paper are summarized as follows:

1. The depth of this survey paper is not enough, lacking of insightful analysis of present solutions.
2. The system level engineering concerns are insufficient, giving the natural engineering attributes of AI systems applications.

## References

- [1] Ken Goldberg. Op-ed: Call it multiplicity: Diverse groups of people and machines working together. *Wall Street Journal*, 21, 2017.
- [2] Daniel L Silver, Qiang Yang, and Lianghao Li. Lifelong machine learning systems: Beyond learning algorithms. In *2013 AAAI spring symposium series*, 2013.
- [3] Ion Stoica, Dawn Song, Raluca Ada Popa, David Patterson, Michael W Mahoney, Randy Katz, Anthony D Joseph, Michael Jordan, Joseph M Hellerstein, Joseph E Gonzalez, et al. A berkeley view of systems challenges for ai. *arXiv preprint arXiv:1712.05855*, 2017.