

# Integrating AI into Operating Systems: an Overview

Sun Shuo, Chenyu Tong

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## **Abstract**

Large language models have recently demonstrated great capability of solving complex natural language processing tasks, and the numerous other machine learning techniques showed potential of enhancing basic operating system functionalities. The great power of LLMs and other machine learning methods have led to a series of innovations in operating system designs. This overview provides a brief examination of AI OS concepts and developments, covering the conceptual frameworks, concrete architectures, and the various contexts from cloud to edge where an AI-enhanced OS could be applied. We will discuss how LLMs augment traditional OS functions, the technical challenges in building such systems, and future directions toward modular, hardware-fused intelligent operating systems, as well as shortcomings and problems in current AI OS designs.

- 1 Introduction**
- 2 Background**
- 3 Conceptual Frameworks**
- 4 Implemented Architectures**
- 5 Synergies: AI and core system functions**
- 6 Challenges**
- 7 Shortcomings and future directions**