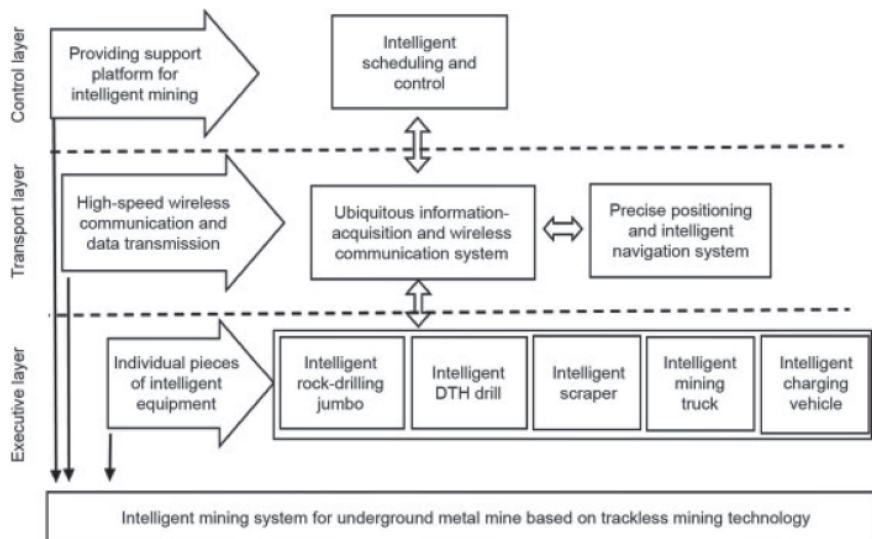


Intelligent underground mining technology

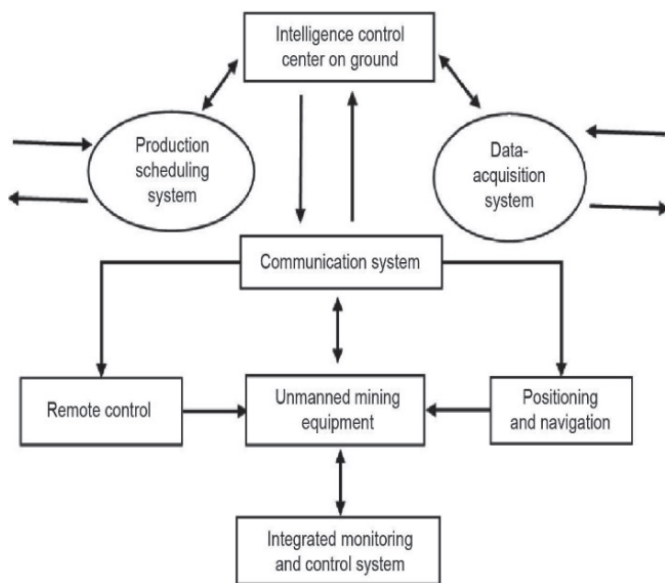
Here is a glimpse of the global research status of underground mining technology, including some specific examples of equipment, technology, and applications. The review is for the latest equipment and technologies with independent intellectual property rights for unmanned mining, including intelligent and unmanned control technologies for rock-drilling jumbos, down-the-hole (DTH) drills, underground scrapers, underground mining trucks, and underground charging vehicles. Three basic platforms are used for intelligent and unmanned mining: the positioning and navigation platform, information-acquisition and communication platform, and scheduling and control platform.

The executive layer mainly consists of trackless mining equipment such as rock-drilling jumbos, DTH drills, underground scrapers, underground mining trucks, or underground charging vehicles. The transport layer mainly includes a

ubiquitous information-acquisition system, wireless communication system, and precise positioning and intelligent navigation system. The control layer is designed as a system-level platform, and is responsible for intelligent



A diagram of intelligent mining technology.



The fundamentals of intelligent mining

mining process scheduling and control.

Integrated communication, sensors, artificial intelligence, virtual reality, information technologies, mobile telephony, computer technologies, and unmanned control equipment are combined in order to achieve intelligent mining technologies. Such technologies are based on precise, reliable, and accurate decision-making and production process management through real-time monitoring; they allow mine production to be maintained at the optimum level, and lead to improved mining efficiency and economic benefits. In this way, green, safe, and efficient mining can be achieved.

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Reference and figure courtesy

Jian-guo Li and Kai Zhan, Intelligent Mining Technology for an Underground Metal Mine Based on Unmanned Equipment, Engineering, Volume 4, Issue 3, June 2018, Pages 381-391