

Electrical and Computer Engineering



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Memory and Storage Technologies in AI Era

Abstract

In this talk, we will delve into the dynamic interplay between software and hardware in the context of advanced artificial intelligence applications. This talk will address how modern software requirements dictate memory and storage hardware functionality, performance, and cost, setting the stage for a detailed exploration of these interactions. A key focus will be a case study on Solid State Drives (SSDs), examining how SSD technology evolves to meet the demanding data throughput and processing needs of Big data and AI/ML systems. We will also explore cutting-edge merging technologies such as Compute Express Link (CXL) and High Bandwidth Memory (HBM), which are critical for enhancing data access speeds and processing power in AI applications. This talk will also cover new possibilities of on-device AI based on memory and storage, highlighting the importance of processing data closer to its source. Finally, we will discuss the new requirements for data privacy in the AI era, with a special focus on privacy-preserving technologies such as Fully Homomorphic Encryption (FHE). This discussion will underscore the challenges and solutions in balancing the demand for advanced data processing with stringent privacy needs.

Bio

Dr. Chanik Park serves as the Corporate Executive Vice President, Head of Memory Technology and Customer Engineering at Samsung Electronics in the USA since December 2021. He leads strategic direction and technical support for technologies such as DRAM, NAND, and SSD. Dr. Park has driven significant innovations, including the development of petabyte-scale SSD solutions for high-performance computing and AI/ML applications, and pioneered an SSD-as-a-Service model for cloud storage, significantly reducing customer CAPEX. His tenure at Samsung includes roles as Corporate VP in both the USA and Korea, focusing on product planning, business development, and strategic corporate initiatives. Dr. Park holds a Ph.D. in Computer Engineering from Seoul National University, specializing in Hardware/Software Co-design for Multimedia Applications. His leadership and innovative approaches have been crucial in advancing Samsung's technology development and adoption in the tech industry.