



سخنرانی های علمی

پژوهشگاه دانشهای بنیادی  
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**Title: Towards Dark Silicon Era in Field-Programmable Gate Arrays**

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**Abstract**

While the transistor density continues to grow exponentially in *Field-Programmable Gate Arrays* (FPGAs), the increased leakage current of CMOS transistors act as a *power wall* for the aggressive integration of transistors in a single die. Hence, the exponential growth of transistor density will be slowed down unless a significant portion of the silicon die is powered off. This phenomenon which is also referred to as *dark silicon* can significantly limit the proportionate increase in the performance and the functionality of FPGAs. The state-of-the-art FPGAs have the industry record of the number of transistors in a single chip and as such, their high power demand will be a severe challenge in the dark silicon era.

In this talk, we first explore challenges of emerging FPGA architectures in dark silicon era and then present two novel architectures, which can significantly improve the power efficiency of existing FPGA designs. We will also address recent and ongoing research studies in this field and discuss possible future works.

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