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Benchmarking emerging logic devices

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As complementary metal-oxide-semiconductor field-effect transistors (CMOS FET) are being scaled to ever smaller sizes by the semiconductor industry, the demand is growing for emerging logic devices to supplement CMOS in various special functions. Research directions and concepts of such devices are overviewed. They include tunneling, graphene based, spintronic devices etc. The methodology to estimate future performance of emerging (beyond CMOS) devices and simple logic circuits based on them is explained. Results of benchmarking are used to identify more promising concepts and to map pathways for improvement of beyond CMOS computing.