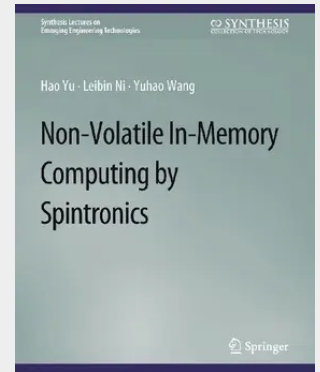


Non-Volatile In-Memory Computing by Spintronics

Exa-scale computing needs to re-examine the existing hardware platform that can support intensive data-oriented computing. Since the main bottleneck is from memory, we aim to develop an energy-efficient in-memory computing platform in this book. First, the models of spin-transfer torque magnetic tunnel junction and racetrack memory are presented. Next, we show that the spintronics could be a candidate for future data-oriented computing for storage, logic, and interconnect. As a result, by utilizing spintronics, in-memory-based computing has been applied for data encryption and machine learning. The implementations of in-memory AES, Simon cipher, as well as interconnect are explained in details. In addition, in-memory-based machine learning and face recognition are also illustrated in this book.

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53,49 €

49,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9783031009044

Medium: Buch

ISBN: 978-3-031-00904-4

Verlag: Springer

Erscheinungstermin: 02.12.2016

Sprache(n): Englisch

Auflage: Erscheinungsjahr 2016

Serie: Synthesis Lectures on Emerging Engineering Technologies

Produktform: Kartoniert

Gewicht: 320 g

Seiten: 147

Format (B x H): 191 x 235 mm

