Topology for Computing. Afra J. Zomorodian. This emerging field utilizes theory from topology and the power of computing to solve problems in diverse fields. Recent applications include computer graphics, CAD, and structural biology, all of which involve understanding the intrinsic shape of some real or abstract space. The author strives to present basic concepts from topology and Morse theory so that nonspecialists can grasp and participate in current research in computational topology.

This book’s self-contained presentation of mathematical concepts from a computer scientist’s viewpoint combines point set and algebraic topologies, group theory, differential manifolds, and Morse theory. The author also presents some recent advances in the area, including topological persistence and hierarchical Morse complexes. Throughout, the focus is on computational challenges and presenting algorithms and data structures when appropriate.


Symbolic Dynamics and Geometry Using D* in Graphics and Game Programming. Brian Guenter and Sung-Hee Lee. The authors explain how to use the D* symbolic-differentiation system for applications in computer games and engineering simulation. They describe how to create procedural 3D geometric models, link them together to form multibody physical systems, and simulate and display their physical behavior in real time.

The symbolic-differentiation capabilities of D* can be used in a wide variety of technical applications, including computer graphics, engineering, and mechanical simulation. Many applications of D* are covered, but two—real time Lagrangian-physics simulation and procedural 3D geometric modeling—are developed in great detail.


Leading the Virtual Workforce: How Great Leaders Transform Organizations in the 21st Century. Karen Sobel Lojeski. Just 20 years ago, going to work meant driving to a physical location to interact face-to-face with a boss and coworkers. Today, this might only require stepping across the hall to a home office or joining a videoconference. According to the author, the implications of these changes are staggering and require a whole new leadership model. She asserts that the virtual workforce has exploded, with mobile workers set to become 73 percent of the US workforce by 2011.

According to Lojeski, physical separation, technology mediation, and disconnected relationships characterize this new virtual distance. These dynamics lead to a psychological separation that negatively affects productivity, innovation, and trust. When virtual distance is relatively high, innovation falls by more than 90 percent and project performance suffers. The author concludes that creating context, cultivating community, and co-activating new leaders builds greater trust, higher levels of satisfaction, and better behavior overall.

Springer; www.springer.com; 978-3-540-92144-8; 876 pp.

Inside Larry and Sergey’s Brain, Richard L. Brandt. This book focuses on what drives these two men and where they will take Google. Looking at this brainchild of two brilliant minds, the author examines Google’s business decisions in light of its founders’ ambitions and beliefs. Larry is the main strategist, while Sergey is the primary technologist and idealist. Through interviews with current and former employees, competitors, partners, and senior Google management, the author demystifies the secret society that is Google while clarifying several misconceptions.


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