

REGULAR PAPERS ISSUE

**575 Cognitive Dynamic Systems: A Review of Theory, Applications, and Recent Advances**

By *W. Hilal, S. A. Gadsden, and J. Yawney*

| CONTRIBUTED PAPER | This article reviews the current state of research literature published on cognitive dynamic systems and their applications.

**623 Bottom-Up and Top-Down Approaches for the Design of Neuromorphic Processing Systems: Tradeoffs and Synergies Between Natural and Artificial Intelligence**

By *C. Frenkel, D. Bol, and G. Indiveri*

| CONTRIBUTED PAPER | This article provides a comprehensive overview of bottom-up and top-down approaches, surveying key design choices and implementation strategies.

**653 Zero-Shot and Few-Shot Learning With Knowledge Graphs: A Comprehensive Survey**

By *J. Chen, Y. Geng, Z. Chen, J. Z. Pan, Y. He, W. Zhang, I. Horrocks, and H. Chen*

| CONTRIBUTED PAPER | This article comprehensively reviews knowledge-graph-aware research for two major sample shortage settings, namely zero-shot learning and few-shot learning.

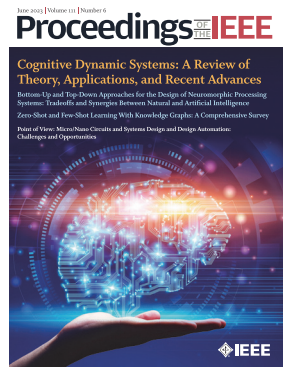
DEPARTMENTS

**558 SCANNING THE ISSUE**

**561 POINT OF VIEW**  
**Micro/Nano Circuits and Systems Design and Design Automation: Challenges and Opportunities**

By *G. Cauwenberghs, J. Cong, X. S. Hu, S. Joshi, S. Mitra, W. Porod, and H.-S. P. Wong*

**686 FUTURE SPECIAL ISSUE/SPECIAL SECTIONS**



**On the Cover:**  
 This month's cover highlights cognitive dynamic systems, which are configured in a manner that mimics the human brain.