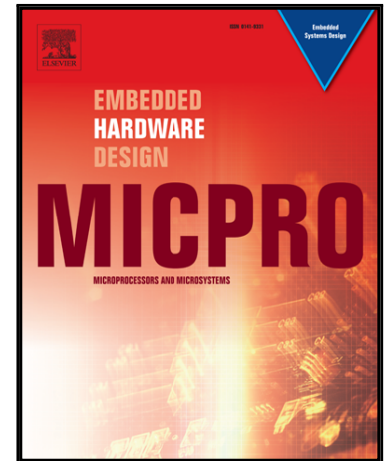


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Bio-inspired Self-Aware Fault-Tolerant Routing Protocol for
Network-on-Chip Architectures using Particle Swarm Optimization

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Highlights

- A routing scheme and fault-tolerant mechanism for the NoC architecture using a PSO methodology is proposed. This scheme uses the synchronous, asynchronous, and self-organizational features of PSO to create a minimal global routing table and intelligent adaptation, which gives rise to scalable, real-time and dynamic routing decisions with high throughput, low latency, and minimum power consumption. An experimental and simulation process for the proposed routing scheme is provided.
- A network routing performance evaluation of the proposed scheme compared with state-of-the-art fault-tolerant routing is provided. BISFTRP demonstrates better routing performance under faulty conditions, compared with state-of-the-art routing protocols.
- BISFTRP router hardware design and implementation results are provided. Post-implementation results show that BISFTRP router has an efficient logic area and power consumption compared with state-of-the-art routers.
- We demonstrate that the proposed routing scheme substantially increases network performance and provides efficient logic area and power consumption.

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