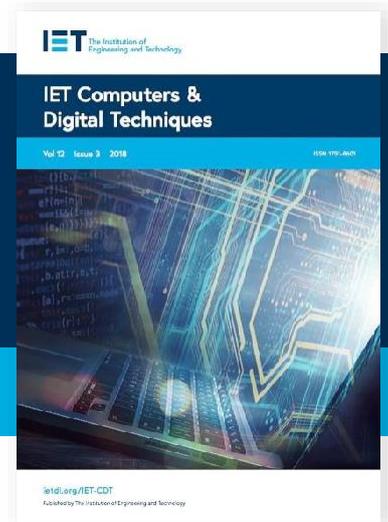# IET Computers & Digital Techniques

Call for Papers

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Editor-in-Chief: Andy Tyrell, University of York, UK
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Special Issue on:

Battery-Free Computing

In order to realise the vision and scale of the Internet of Things, we cannot rely on mains electricity or batteries to power devices due to environmental, maintenance, cost and physical volume implications. Considerable research has been undertaken in energy harvesting, allowing systems to extract electrical energy from their surrounding environments. However, such energy is typically highly dynamic, both spatially and temporally. In recent years, there has been an increase in research around how compute can be effectively performed from energy harvesting supplies, moving beyond the concepts of battery-powered and energy-neutral systems, thus enabling battery-free computing. This special issue aims will explore the challenges, issues and opportunities in the research, design, and engineering of energy-harvesting, energy-neutral and intermittent sensing systems. These are enabling technologies for future applications in smart energy, transportation, environmental monitoring and smart cities. Innovative solutions are needed to enable either uninterrupted or intermittent operation. High quality technical articles are solicited, describing advances in computer systems powered by energy harvesting, as well as those which describe practical deployments and implementation experiences.

Topics of interest include, but are not limited to:

- Hardware and software concepts, algorithms and circuits for battery-free computing systems
- Resource management and operating system support for battery-free computing systems
- Modelling, simulation and tools for effective design of future battery-free computing systems
- Middleware and services supporting interoperability between battery-free computing systems
- Architectures and standards for battery-free computing systems
- Novel microarchitectures for ultra-efficient, energy-constrained computing
- Memory systems designed for robustness to intermittent operation
- Architectures, platforms, software, and programming languages for intermittent computing.
- Approaches to communication and networking in battery-free computing systems
- Online measurement and prediction of energy intake and consumption
- Power management concepts, algorithms and circuits for battery-free computing systems
- Ensuring reliability, security and safety in battery-free computing systems
- Internet of (battery-less) things
- Experience with real-world deployments and innovative applications

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