

Introduction to Sustainability in the Fourth Industrial Age: Technologies, Systems and Analytics Minitrack

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The final report of the World Commission on the Environment and Development, also known as the Brundtland Report, defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Subsequent international efforts such as the Rio de Janeiro Conference in 1992, the publication of Agenda 21, the Rio+5 special session of the United Nations (UN) in 1997, the formation of the World Business Council for Sustainable Development in 1997, and the Rio+20 UN Conference on Sustainable Development can be credited with raising environmental concerns to increase public awareness, serving as an initial focus and impetus for collaboration as well as conflict between government, industry, and academia. The Johannesburg “Plan of Implementation”, revealed at the Earth Summit 2002, affirmed commitment by the UN to fully implement Agenda 21. Environmental management systems standards (EMSS) such as ISO 14001 and the European Eco-management and Audit System (EMAS) provide a sound practical basis for environmental management within organizations.

Information systems (IS) support both immediate action and sustainable long-term strategies, helping to address the urgency and scope of environmental problems. This mini-track emphasizes the significant research synergies that exist between IS and environmental management for sustainable development from an organizational as well as a technical perspective. Collaboration and cross-fertilization between these domains can be mutually beneficial and may in fact present unique, timely and socially relevant ‘real-world’ research opportunities as well as viable public sources of empirical ecological information for interdisciplinary research and application. The mini-track accommodates both research articles and practitioner reports exploring technical and organizational issues that pertain to the development, implementation, and deployment of IS in sustainable development.

The mini-track is receptive to all types of research methodologies. Possible topics include, but are not limited to:

- Analytics and decision technologies
 - Integrated environmental modeling for decision support

- Approaches and frameworks for leveraging ‘Big Data’
- Data mining and machine learning
- Decision making
 - Sustainable development and decision making
 - Decision dynamics, processes, and issues in the context of multiple stakeholders
- Knowledge management
 - Environmental knowledge acquisition and management
 - Expert knowledge-based systems for environmental management
- Environmental Management Information Systems (EMIS) and Environmental Decision Support Systems (EDSS)
 - EDSS and EMIS design and integration
 - Intelligent EDSS
 - Applications and case studies of EDSS and EMIS for sustainable development
 - Evaluation and cost/benefit analysis of EDSS and EMIS
 - Adoption and diffusion of decision technologies and EMIS
 - EMIS and their role in Green IT
- Environmental cyber-infrastructure
 - Cloud computing
 - Environmental model management including model sharing and reuse
- Environmental communication
 - Environmental online communication and collaboration
 - Environmental education
 - Information systems and environmental reporting
 - Community building and social software applications
- Technologies for decision support systems (DSS) development and environmental applications (e.g., geographic information systems, computational intelligence, service-oriented computing, web services, semantic web, artificial intelligence, agent-based computing, and multiple criteria decision making)