Guest Editor's Introduction

Growing Up With Pervasive Computing

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A NUMBER OF pervasive computing products and services are now available for play, education, learning, and smart living. It is, therefore, important to understand how they affect—and how they are used by—children and teens who are growing up taking this technology for granted. These technologies may be appropriated by children in ways that have not been foreseen and may influence child's development in important ways. It is, therefore, important to develop ways to design and evaluate pervasive technology in relation to children and to develop technology suitable for children and teens and their needs.

This is a rich and wide-ranging application domain, and a number of experts are increasingly drawn to it from diverse fields such as human–computer interaction; design; education; arts and entertainment; artificial intelligence and machine learning; psychology; sociology; mobile, wearable, and ubiquitous computing; ambient intelligence; and robotics.

This Special Issue explores the use of pervasive technology by and for children and teens.

The first article, "Monitoring Children's Learning through Wearable Eye-Tracking: The Case of a Making-Based Coding Activity," sets out to quantify whether pervasive sensing, including mobile eye-tracking, can be used to quantify child's learning. The authors present promising results and propose a new research agenda for sensor-informed learning.

The second article, "Child–Robot Theater: Engaging Elementary Students in Informal STEAM Education Using Robots," presents a longitudinal assessment of an after-school program that combines science, art, and technology in live theatre. This work points toward new ways that pervasive technology can enhance learning.

The third article, "CLIMB: A Pervasive Gameful Platform Promoting Child Independent Mobility," presents a platform to support the daily travel between home and school for elementary school students. The platform supports a number of different aspects of travel, including educating students.

The fourth paper, "Accounting for Dynamic Diversity among Child Users of IoT" discusses the ethical implications of designing IoT system for children, and provides suggestions on how to overcome these significant challenges.

The final article, "Workshop Design for Hands-on Exploration Using Soft Robotics and Onomatopoeia," describes how soft robots can be used to lower the barriers to hands-on exploration with robotics. The work uses storytelling to enable students to explore new concepts.

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The collection of articles in this Special Issue illustrates the wide range of ways in which pervasive computing can contribute to education and learning. At the same time, they provide a glimpse of the future, where technology-informed and enabled learning is an everyday part of growing up. We hope that these articles will inspire new work, new ideas, and new directions in thinking about how technology shapes the future of learning, education, and growing up.

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