Engaging with Computer Science through Play and Performance
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The current international decline in applications to study computer science at university will ultimately lead to obvious economic knock on effects. We are involved in a series of outreach projects that freely mix art and science to address the problems. They aim to capture the imagination of the next generation of computer scientists, showing them the creativity and challenge of the subject. Two of our main activities are the cs4fn webzine (www.cs4fn.org) and sodarace (www.sodarace.net). We use creative play and performance as a bridge to foster dialogue and shared awareness between two very different audiences: a broad public of learners, both in and out of school, and the computer science research community. They have wider and more altruistic aims than standard institutional widening participation initiatives.

cs4fn is a free webzine/magazine that brings computer science research to school children in an engaging and fun way. A new area on “The FUNdamentals of Computer Science” (www.dcs.qmul.ac.uk/cs4fn/fundamentals) uses interactive games, magic and puzzles that directly encapsulate the understanding of core Computer science topics to give an accessible introduction to the subject. cs4fn also incorporates research studies based on a game paradigm that gives participants a deeper understanding and engagement through play. In schools workshops we follow a similar approach to help make the abstract visible using the classroom as a performance space. The audience participate as components in the “machine” in performances of computation – executing programs, algorithms or even neural computation.

Sodarace comprises a race between virtual robots, either built by the public with the BAFTA winning Sodaconstructor interface and learning support from the Sodarace community forums, or created by Artificial Intelligences. This provocative Sodarace narrative of human creativity vs. machine intelligence has been successfully applied across a wide range of disciplines from science to art. Sodarace national curriculum lesson plans are available in diverse areas such as physics and evolutionary biology. It can be used to explore the laws of physics, the mathematics of parameters, optimisation and simple differential equations, design articulated pictures, play with evolving ‘life’ on other worlds, build a model of the solar system, a working clock, pin ball machines, roller coasters, cartoon characters, experimenting with how things like animals move, explore how a computer program works, and show how evolution optimises for an environment. With respect to Computer Science it encourages students to develop an understanding of Artificial Intelligence, the principles of computer science and software development and to experience for themselves experimental scientific discovery. The project impacts globally with an established community of over 130 000 registered users, aged 7-70. By using Queen Mary undergraduate students to develop the Artificial Intelligence software as projects during their study (www.dcs.qmul.ac.uk/sodarace/) we provide positive student role models as well as open source software for the community to experiment with and develop further. Sodarace roadshow events such as at the Royal Society Summer Exhibition 2005 give an indication of excellence in science with broad appeal: the most common response from students was ‘wow!’