

Meltdown

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Abstract. One grand challenge in computer science concerns the development of unusual and non-classical approaches to computation and the development of computer systems. One branch of computer science is looking to biology for inspiration in the construction of computer systems. The development of biological systems uses a very different approach to computer machines. Networks of dynamic interactions drive the development of the organism. The DNA encodes not a blueprint for a fixed, static structure, but a dynamic, constantly changing structure which results in a changing structure. The challenge is to develop an equivalent computer system development approach. This science fiction prototype uses a story to highlight the contrast between traditional computing and an as-yet undefined approach modelled on developmental biology. The story describes how a new type of computing based on developmental biology and molecular genetics enables creatures to be made which exist in computerised ecosystems and are able to move through traditional systems correcting problems. The complexity of traditional systems in a hospital is such that information degrades and a ‘meltdown’ occurs. It is the IT manager’s connection with a firm called ‘Individuality’ that results in the rescue of the hospital’s systems. The story also speculates on the potential for emergent behaviour that might occur in an information environment whose complexity threatens to exceed our ability to understand and manage it.

Keywords: Information complexity, Bio-inspired computing, health systems, science fiction prototyping.

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