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The Nerve Garden: Plant A Seed in Cyberspace

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THE NERVE GARDEN: PLANT A SEED IN CYBERSPACE

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When as children we were presented with the gift of a terrarium, aquarium, ant farm or chemical garden, we were given much more than a toy. We were given dresser-top universes that gave us admiration and passion for the natural world. Cyberspace is becoming an increasingly rich space for the evolution of form. *Nerve Garden* seeks to express natural forms by allowing people to

plant a seed in cyberspace and populate a virtual terrarium (Fig. 1).

Nerve Gardeners use a Java applet to germinate compelling models of plants from L-systems, a kind of fractal genetic algorithm. Users can mutate their plants' forms and even generate animals that possess branching or segmented body plans (such as arthropods). The user's final step is to place their virtual organisms into a collective garden, expressed in a three-dimensional Virtual Reality Modeling Language (VRML) scene.

The next version of *Nerve Garden* will feature a neural network system (called "Nerves") that will enable the continued growth and decay of plants, as well as a simple ecosystem of tokens that represent water or photons and "polyvores," creatures that consume the polygons that make up plants. *Nerve Garden* is designed to prove that one can build a compelling cyberspace using generative methods. It makes no sense to send large models or sounds over the thin pipes of the Internet when algorithms that will generate the models at their destination can be sent instead.

Well into the next century, the offspring of synthetic ecosystems such as *Nerve Garden* will harbor autonomous forms that are arguably alive. If life is

just a matter of data structure complexity, metabolism and evolution, then it is immaterial whether organisms are constructed of atoms or bits.

What does life seek by entering digital space? With the ultimate demise of the Earth, the evolution of complex and beautifully adapted forms will come to an end—that is, if life remains trapped at the bottom of Earth's gravity well. Life expressed in bits is massless and can travel at the speed of light with low energy expenditure toward a receiving station at the other end. Software uploaded to enhance the simple brains of spacecraft such as Galileo provide us with twentieth-century examples of the extension of the Earth's biota. Deep into the twenty-first century, distant nanofabricators will spin matrices supporting digital biota on the vast energetic surfaces of the solar system.

Nerve Garden can be experienced at <<http://www.biota.org/>>.

Acknowledgments

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Fig. 1. Nerve Garden. Flight of the bumblebee over one of dozens of Nerve Gardens planted inside three-dimensional virtual worlds in cyberspace, 1997.

