

PS1 Robotics for Growing Life

Henrik Hautop Lund (Technical University of Denmark, Denmark)

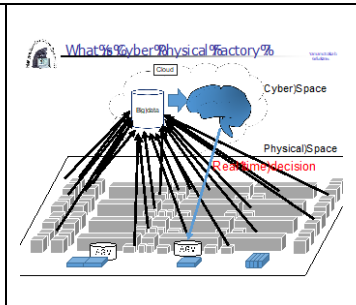
We present a novel direction of artificial life robotics in which we use robotics to control the growth of real, natural life. The concept of using robotics to grow life present itself as a potential sustainable solution for food production, allowing an optimization of food quality and outcome. We illustrate this concept with our development of the Growbot, which is a tabletop size robotic green house for growing edible food plant. The GrowBots use sensors such as humidity, CO₂, temperature, water level and camera sensors, and actuators such as full spectrum LEDs, IR LEDs, UV LEDs, fertilizer and water pumps, air change and air fan. The software acts as recipes for the plant growth in the robotic greenhouse adjusting the environmental condition for the growth of the living plants such as salad, parsley and basil.



PS2 Road To Cyber Physical Factory(Application Examples of Intelligent Factory and its Technology)

Hidehiko Yamamoto (Gifu University, Japan)

Since 1980, Computerized machine tools and robots have been developed. I talk about the history of the Intelligent manufacturing systems and their technology including Artificial Intelligence and GA. The technology are as follows. The future factory by using Autonomous System, we call Autonomous Decentralized Flexible Manufacturing Systems, is presented. The virtual factory and several kinds of simulations for production systems and scheduling problems is presented. The simulations application examples for automobile production lines are presented. IoT production and Cyber Physical Factory which is the near future manufacturing model are presented. Its application example for automobile parts production is also presented.



PS3 Robot Technology, and it's Development Trend–Developing a New Networking Robot System-

Takao Ito (Hiroshima University, Japan)

Robot technology has been changed dramatically with massive development of internet environment. The author reviewed a plethora of literature and investigated advanced robot technologies. Today, most of typical robot technologies are used in single-cause-oriented products, such as robot vacuum cleaner and Asimo, a humanoid robot invented by Honda. These advanced products played important role in our modern society. For further development, a networking robot system with advanced technologies of internet and artificial intelligence is required in order to copy with the uncertainty in the future. Different technology should be combined and linked together for multiple-goal-oriented approach in the networking robot system. For evaluating the validity of our new system, a centrality index is introduced in this research.

