

Artificial symbiosis: Towards a robot-microbe partnership

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Abstract

The development of the robot EcoBot II, which exhibits some partial form of energetic autonomy, is reported. Microbial Fuel Cells were used as the onboard self-sustaining power supply, which incorporated bacterial cultures from sewage sludge and employed oxygen from free air for oxidation in the cathode. This robot was able to perform phototaxis, temperature sensing and wireless transmission of sensed data when fed (amongst other substrates) with flies. This is the first robot in the world, to utilise unrefined substrate, oxygen from free air and perform (three) different token tasks. The work presented in this paper focuses on the combination of flies (substrate) and oxygen (cathode) to power the EcoBot II.