

Domains of Plasticity

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Evolutionary Robotics

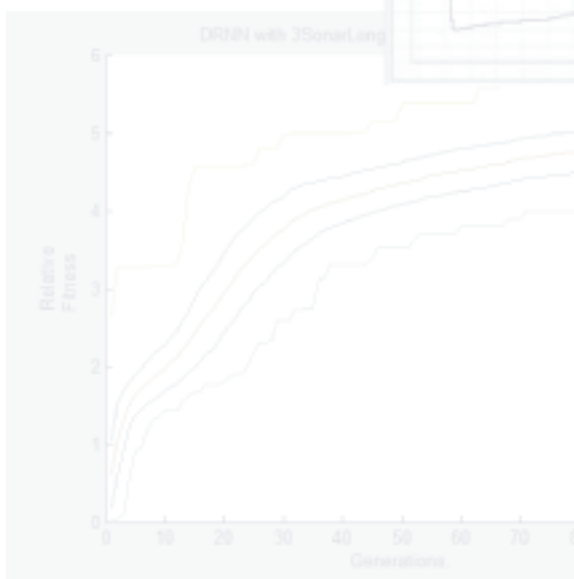
An EASy MSc Dissertation by Dan Cowan.

The highs of human cognition, such as mathematics or poetry, find their grounds in very much simpler processes. Cognition supports behaviour and behaviour is what life does to maintain its very being.

Success, survival in a contingent world, requires adaptive behaviour. Biological systems show lifetime adaptation in skill acquisition, species also adapt to their niches across evolutionary time. Adaptivity presupposes plasticity.

It is my belief that biological systems can be described as being embodied in multiple domains of plasticity. As an advanced social species we are **physically, historically, morphologically** and **phenomenologically** embodied. Each of these domains further determines and enhances our adaptive potential.

The complexity of biological cognition is enabled by these domains of plasticity.



The application of genetic algorithms to the parametrisation of robot control architectures began here at Sussex 10 years ago. In the meantime Evolutionary Robotics has become a key research area within artificial-life.

Much of the work in evolutionary robotics has involved the optimisation of weight sets and architectures for neural network controllers.

By ceding control of the sensory-motor interface and the sensor morphology to evolutionary optimisation I aim to explore the effect on evolvability of further domains of plasticity.