Abstract: One of the objectives of Evolutionary Computation (EC) has been to understand the processes of natural evolution and then model them algorithmically. Hans-Paul Schwefel, in his 1997 paper on the future challenges for EC argues that the more an algorithm models natural evolution at work in the universe, the better it will perform (even in terms of function optimization). There is enough data to suggest that slight differences in the understanding of the natural evolution can cause the associated Evolutionary Algorithms (EA) to change characteristically. The present paper tests Schwefel's hypothesis against Charles Sanders Peirce's theory which places semiotics, the theory of signs, at the heart of universal evolution. This course is followed because of three primary reasons. Firstly, Peirce has not been seriously tested in EC, although there have been EA based on other theories and sub-theories. Secondly, Peirce's universal theory, by not being restricted to biological evolution alone, qualifies for Schwefel's hypothesis, perhaps more than most other theories that have already been modeled algorithmically. But most importantly because, in experimental terms, it warrants an original claim that Peirce's insights are useful in improving the existing EA in computer science, as Peircean EA can potentially solve some of the major problems in this area such as the loss of diversity, stagnation, or premature convergence. This paper provides a novel framework and consequently a simple algorithm based on Peirce's theory of evolution, and tests it extensively against a benchmark set of mathematical problems of varying dimensions and complexity. Comparative results with classical and advanced EA form another significant part of the paper, and help in

strengthening the viability of Schwefel–Peirce hypothesis for EC.

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