Emulating cognitive phenomena using neuroevolution

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We present a novel approach to the study of cognitive phenomena by using evolutionary computation. To this end we use a spatial, developmental, neuroevolution system. We use our system to evolve ANNs to perform simple abstractions of cognitive tasks such as size perception, counting, color identification and reading. We define these tasks to explore hypotheses about the evolution of counting and the nature of the Stroop effect. Our results show the versatility of our evolutionary system. We show that we can evolve it to perform a variety of cognitive tasks, and also that evolved networks exhibit interference behavior when dealing with multiple tasks and incongruent data.