



## **N.E.ME.SYS: A PLANETARY LEGGED ROVER CONTROLLED WITH DYNAMICAL ARTIFICIAL NEURAL NETWORKS**

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**ABSTRACT**—This paper concerns the realization of the N.E.Me.Sys planetary six-legged rover controlled by a dynamical Artificial Neural Network. The parameters of the neural controller have been defined using Evolutionary Algorithms, thus following a biomimicry approach. A very meticulous investigation of the properties of such an innovative controller has been performed throughout simulations, demonstrating the very high robustness degree of the rover in facing obstacles, craters or uneven terrains. These very brilliant results have been confirmed also on the physical test-bed, thus rising the interest in studying innovative strategies for future planetary exploration.

**Key Words:** neural controller, artificial neural network, evolutionary algorithms, legged-robot, planetary exploration, biomimicry