

Reasoning the Survival Condition from Manicure Ghost Crab's Housing Behavior using CFD analyses

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ABSTRACT

Recently, research activities on the nature inspired technology were prevalent in engineering fields. Surviving for 35 billion years in earth, living things have developed their organisms to fit the wild nature environments. A new trial to find advantages of living things and apply ideas from them to engineering industry is getting focus in these days. [1,2] Moreover, these activities have been evolved into a new academic field which is biomimicry. Jeine Benyus[3] classified biomimicry into three parts. One is characterized by "nature as measure" which studies on the survival method of living things. This paper belongs to this part.

In this paper, interdisciplinary studies have been conducted to reveal the evolutionary direction of living things which could be the first step of nature inspired technology. First of all, we collected and clarified data about Korean manicure ghost crabs (scientific name: *Cleistostoma dilatatum*) which build conical structure on top of their houses. From the obtained data, the way of evolution is studied by applying engineering technologies. The house of manicure ghost crab is analyzed by applying computational fluid dynamics. It is clearly observed that the effort by a small crab in housing dramatically increases the chance for survival for the given environmental condition.

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