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From Ephemeral Computing to Deep Bioinspired Algorithms: New Trends and Applications

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Abstract

Ephemeral computing is a term that describes computing systems whose nodes or their connectivity have an ephemeral, heterogeneous and possibly also unpredictable nature. These properties will affect the functioning of distributed versions of computer algorithms. Such algorithms, which are usually straightforward extensions of sequential algorithms, will have to be redesigned and, in many cases, rethought from the ground up, to be able to use all ephemerally available resources. Porting algorithms to an inherently ephemeral, unreliable and massively heterogeneous computing substrate is thus one of the main challenges in the ephemeral computing field. Algorithms adapted so that they can be consciously running on this kind of environments require specific properties in terms of flexibility, plasticity and robustness. Bioinspired algorithms are particularly well suited to this endeavour, thanks to their decentralized functioning, intrinsic parallelism, resilience, adaptiveness, and amenability for being endowed with algorithmic components dealing with both the massive complexity of the

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