

[Allen, Benjamin L.](#); [Steel, Mike](#)

Subtree transfer operations and their induced metrics on evolutionary trees. (English)

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Ann. Comb. 5, No. 1, 1-15 (2001).

This interesting paper systematically studies three important local rearrangement processes of subtrees of evolutionary trees to determine their relationships, furthermore to investigate their combinatorial complexity. The three operations are: nearest neighbor interchange (NNI), subtree prune and regraft (SPR), tree bisection and reconnection (TBR). It is clear that NNI is a special form of SPR, and, similarly, SPR is a special form of TBR. The paper determines the size of the different neighborhoods of a tree under these operations and establishes bounds among the respective metrics. It also studies the maximum agreement forests. Finally it shows that the TBR-distance problem in general is NP-hard.

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MSC:

[05C05](#) Trees

[92D15](#) Problems related to evolution

[68R10](#) Graph theory (including graph drawing) in computer science

[68Q25](#) Analysis of algorithms and problem complexity

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