

1112-05-88

**Eva Czabarka, Laszlo A. Szekely\*** (szekely@math.sc.edu) and **Todd J. Vision.** *Number of gene duplication episodes and Gallai's min-max theorem on intervals.*

In 1996, Guigo et al. [Mol. Phylogenet. Evol., 6 (1996), 189–203] posed the following problem: for a given species tree and a number of gene trees, what is the minimum number of duplication episodes, where several genes could have undergone duplication together to generate the observed situation. (Gene order is neglected, but duplication of genes could have happened only on certain segments that duplicated). We study two versions of this problem, one of which was algorithmically solved not long ago by Bansal and Eulenstein. We provide min-max theorems for both versions that generalize Gallai's archetypal min-max theorem on intervals, allowing simplified proofs to the correctness of the algorithms (as it always happens with duality) and deeper understanding. An interesting feature of our approach is that its recursive nature requires a generality that bioinformaticians attempting to solve a particular problem usually avoid. (Received July 21, 2015)