

1096-VN-1842      **Daniel Gray\*** (dgray1@ufl.edu). *Bounds on superpatterns containing all layered permutations.* Preliminary report.

In the study of pattern containment, a  $k$ -superpattern is a permutation which contains all  $k!$  permutations of length  $k$  as a pattern. One may also consider restricted superpatterns, i.e. a permutation which contains, as a pattern, every element in some subclass of the set of permutations of length  $k$ . Here, we find lower and upper bounds on a superpattern which contains all layered  $k$ -permutations. Also, we exhibit a connection between the sum of depths of null-balanced binary trees on  $k$  vertices. (Received September 16, 2013)