Equivalence classes of Mesh patterns with a dominating pattern

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A permutation is an arrangement of n objects. We can define sets of permutations by the avoidance of subsequences with certain properties. One of these is *classical pattern avoidance* where the values of the entries in the subsequence must not have a particular ordering. Classical patterns capture interesting properties of permutations such as stack sortability, and as such have links to different combinatorial objects. Mesh patterns are an extension of classical patterns that allow more restrictions on the occurrence of the patterns. We say that two sets of patterns are *coincident* if they are avoided by the same set of permutations. We establish sufficient conditions for coincidence of mesh patterns, whilst also avoiding a longer classical pattern. These conditions, along with two special cases, completely classify coincidence between families containing a mesh pattern of length 2 and a classical pattern of length 3.

(Supervised by Michael Albert)