Report for *On the Correct Characterisation of Fitness Landscape Neighbourhood Topologies* by Garrison Greenwood

I cannot recommend this paper for publication. I say this with much regret for it is a well written and easily understood paper (having just reviewed a series of papers that were neither I much appreciated this). However, I believe the author is attacking a straw man.

The author asserts that many people believe that search operators induce a topology on a landscape and then shows that this is nonsensical when considering the crossover operator. However, I know of no one who believes that crossover induces a landscape. Indeed it is an active area of research to try and find a meaningful analogy to landscape that makes sense when talking about crossover. Colin Reeves for example have written several papers on this subject. The author even admits that Stadler *et al.* also acknowledge that the crossover operator does not give anything analogous to a metric space.

However, the authors view that the only consistent view of landscape is through a genotype-phenotype mapping is extreme. It seems to presuppose that there is a natural representation of any problem. This simply is not true of problems such as the TSP. Furthermore, mutation type operators do induce a neighbourhood structure which can be used to define a metric. For example if I consider all possible mutations of one or two bits of a string then I obtain a neighbourhood. This neighbourhood can have a different set of local minima to the Hamming neighbourhood. This is extremely important for search algorithms. It would be very complicated to find a genotype-phenotype encoding of the problem which had the same neighbourhood structure. The author seems either to be oblivious of this view or else has wilfully decided not to discuss it. In either case this seems to be a critical flaw in his paper.