Desperately Seeking Something

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There is a growing interest in novelty search: that is, in sampling a parameter space to search for radical or unexpected behaviour(s), occurring as a consequence of parameter choice, being input to some downstream complex system, process, or service that will not yield to analysis, without imposing any specific pre-ordained objective function, or fitness function to be optimised. We mean "parameter" in the widest sense, including system learnables, non-autonomous forcing, sequencing and all inputs. Depending upon the nature of the underlying parameter space of interest one may adopt a rather wide range of search algorithms. We do consider that this search activity has meta-objectives, though: one is of achieving diversity (efficiently reaching out across the space in some way); and one is of achieving some minimum density (not leaving out large unexplored holes). These are in tension. However, the applications requiring novelty search arise, one should avoid rushing to code-up a standard evolving search algorithm and instead give some thought to the nature and requirements of the search: there is a range of effective options available. We give some considered advice.