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Modelling insight: The case of the nine-dot problem

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Abstract: A number of frameworks for capturing insight phenomena have been proposed, but there are no executable models of knowledge-lean insight problem-solving. Here, an ACT-R model is presented for the nine-dot problem, which implements the Criterion for Satisfactory Progress theory for this problem. The model has two main components: a mechanism for searching for possible moves in the problem representation, and a mechanism for expanding the search to discover new moves not immediately available in the initial problem representation. The model accounts for key phenomena including impasse, fixation and the 'aha' moment, as well as predicting the relative difficulty of different problem variants.