

Very good!

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7.349 Abstract  
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The recent implementation of logical computing using Wang-like tiles built from DNA opens the door to the design of larger and more flexible DNA-based systems. We describe a two-dimensional system of DNA computing based on the Boolean tree-like circuit (BTLC) method of representing Boolean functions. Our proposed system consists of two layers: a template layer consisting of programmable "pawns" that correspond to the nodes of a BTLC, and an array of input tiles that represent the values assigned to each node. Careful tile design allows computation to proceed by exploiting the selectivity of DNA binding; initial input tiles are pre-assembled on the pawns, after which additional tiles representing the output of successive computations assemble by properly base-pairing both to adjacent input tiles and to node labels extending from the template layer. From this basic design one may conceive a fully programmable "pegboard" arrangement of pawns whose conformation can be manipulated to produce arbitrary BTLCs. This system is Turing-universal and, unlike previous molecular computation schemas, imposes a fundamental distinction between program and data, thus allowing for great flexibility in the problems to which the system might be applied.

} a little too much detail for the abstract. highlight computation occurring on the second level.

actual DNA motifs shown.  
extending to 3D.

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