Input-Driven Queue Automata[*] [**]

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Abstract. We introduce and study the model of input-driven queue
automata. On such devices, the input letters uniquely determine the
operations on the memory store which is organized as a queue. In par-
ticular, we consider the case where only a finite number of turns on
the queue is allowed. The resulting language families share with regular
languages many desirable properties. We show that emptiness, finite-
ness, universality, inclusion, and equivalence are decidable. In contrast,
all these problems are shown to be undecidable if the condition on a
finite number of turns is dropped. Furthermore, we investigate closure
under Boolean operations. Finally, the existence of an infinite and tight
hierarchy depending on the number of turns is also proved.