

Nibbler: Implementing a Turing machine to simulate the Busy Beaver problem

Bachelor's Thesis

Busy Beavers are n -state Turing machines which are started on an initially blank tape and produce a maximal number of symbols without entering an infinite loop. This number is called $\Sigma(n)$ and is easily proved to be noncalculable.

In this thesis, we explore a range of techniques successfully employed to determine $\Sigma(n)$ for small n . We also explain our open source implementation, Nibbler, which provides an easy-to-use framework for working with Busy Beavers.