THE WOLFRAM
2,3 TURING MACHINE
RESEARCH PRIZE

$25,000 prize

Is this Turing machine universal, or not?
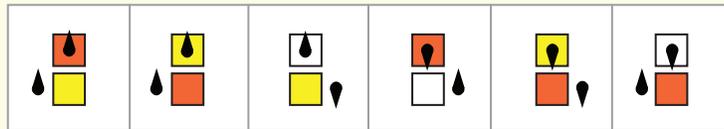
The machine has 2 states and 3 colors, and is 596440 in Wolfram's numbering scheme.

If it is universal then it is the very smallest universal Turing machine that exists.

*A universal Turing machine is powerful enough to emulate any standard computer.
The question is: how simple can the rules for a universal Turing machine be?*

*Since the 1960s it has been known that there is a universal 7,4 machine. In A New Kind of
Science, Stephen Wolfram found a universal 2,5 machine, and suggested that the particular
2,3 machine that is the subject of this prize might be universal.*

The prize is for determining whether or not the 2,3 machine is in fact universal.

PRIZE COMMITTEE INCLUDES:

Lenore Blum ▪ **Greg Chaitin** ▪ **Martin Davis** ▪ **Ron Graham**
Yuri Matiyasevich ▪ **Marvin Minsky** ▪ **Dana Scott** ▪ **Stephen Wolfram**
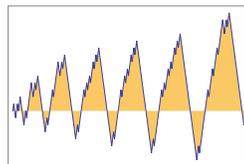
Excursions of the Turing machine head.
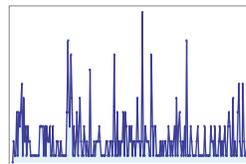
Spacings between jumps of the right
edge of the compressed evolution.
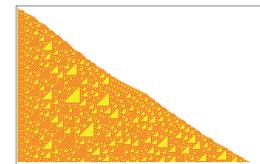
A compressed version of the Turing
machine evolution.

For more information and for offical rules and guidelines, visit:

www.wolframprize.org