A NOTE ON HOMOGENEOUS EXPERIMENTS WITH FINITE AUTOMATA

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ABSTRACT

Some papers, e. g., [1, 2], are concerned with the question whether there exists, for a given sequential machine, a homogeneous experiment which would bring it into a uniquely determined state, not depending on the initial state of the machine. The problem was solved for Moore's machines with distinguishable states. In the present paper, the corresponding problem is treated for autonomous automata (i. e., without output). Necessary and sufficient conditions for the existence of such experiments are stated and estimates of their minimal length are established.

Preface to the Translation[1]

In order to keep the translation as close as possible to the original paper, we explain here some notation which is used but not explained in this paper.

The subset relation is denoted by $\subset$. Hence, if $X \subset Y$ holds, then either X is a proper subset of Y or X and Y coincide.

The set $\mathbb{N}$ of the natural numbers contains the number 0.

References

[1] E. F. Moore, Gedanken-experiments on sequential machines. In: C. Shannon, J. Mc-Carthy (eds.), *Automata Studies*. Annals of Mathematics Studies 34, Princeton University Press, 1956, 129–153.

[2] S. Ginsburg, On the length of the smallest uniform experiment which distinguishes the terminal states of a machine. *Journal of the ACM* **5** (1958) 3, 266–280.

[3] J. Černý, Poznámka k homogénnym experimentom s konečnými automatmi. *Matematicko-fyzikálny Časopis, Slovenská Akadémia Vied* **14** (1964) 3, 208–216.

[(A)]This paper originally appeared in Slovak ([3]) while the author worked at *Vysoká škola dopravná* in Žilina, Czechoslovakia. A preliminary version of the translation was written by Ján Černý himself and some colleagues. This final translation is written by Markus Holzer and Bianca Truthe, both University of Giessen, who appreciate the advice of Michal Hospodár, Slovak Academy of Sciences.

[1]This section is not part of the original paper.