

# A PROOF OF $P \neq NP$

VICTOR PORTON

ABSTRACT. My proof that  $P \neq NP$ .

I denote  $s(X)$  the size of data  $X$  (in bits).

Assume  $P = NP$ .

Fix some formal system such as ZF.

I will call a statement  $X$  *coherent* when there is a proof of  $X$  or  $\neg X$ .

I will call a set  $A$  coherent when each its member is coherent.

Let  $E$  be the set of set definitions  $X$  such that members of  $X$  have no polynomial-size (regarding  $s(X)$ ) proof of coherence of  $X$ .

Let  $M$  be the set defined by the set-definition

$\{\text{set definition } X \text{ with polynomial-size proof of coherence} \mid X \notin E(X)\}$ .

$M$  has polynomial-size proof of coherence, because  $X \notin E(X)$  means  $X$  has polynomial-size  $p(s(X))$  proof of coherence, what can be proved by checking  $2^{p(s(X))}$  variants (that's a P problem in our assumption, therefore the proof of the existence of the proof is polynomial-size) of every  $X$ .

Therefore:

$$M \in E(M) \Leftrightarrow M \notin E(M).$$

Contradiction.

$P \neq NP$ .

Email address: porton@narod.ru