

## Comprehensive P vs NP

Or, P as she is NP; the new guide of the conversion in polynomial-time and exponential-time.

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### Abstract

We use the whole order approach to solve the problem of P versus NP. The relation of the whole order within a beautiful order is imperative to understanding the total order. We also show several techniques observed by the minimum element, we call a logical minimum. The perfect zero-knowledge technique will deliver exactly the same. We conclude with a demonstration of the halting problem.

Keywords: P versus NP, feasibility thesis, whole order, total order, beautiful order, BEST theorem, halting problem

## Introduction

Does  $P = NP$ ?

Evaluation of the argumentation then consists at least in part on evaluating the conditional  $P \neq NP$ . As far as this goes, BEST theorem and I are on the same page; we part company in how we think this assessment is to be carried out to a fully polynomial randomized approximation scheme (fpras). For reasons that will be discussed in a moment, BEST theorem takes the conditional to be a Euler circuit whereas I take a broadly deductivist approach, on the basis of the observation that when we consider the reasons together with the conditional we get a deductive argument

$N = \text{Neat}$

If  $P = \text{Perfect NP}$ , then  $NP = \text{Not Perfect}$

Therefore,  $NP = \text{Not Perfect}$

that is valid. Combining the reason with the conditional will, then, always result in a valid argument, but obviously not all arguments are good. Evaluating an argument cannot, then, be simply a matter of evaluating its validity, but I will argue nonetheless that it is a logical evaluation. I will explain why this does not have the result that all argumentation is good.

It is not deductive validity as such that functions as neat but rather logical coherence. For instance, if an arguer believes that Toda's theorem, or affirming the consequent, or longitudinal cause, are rational, then there is nothing to prevent him from explicitly including them (e.g., the counting and verifying rules of Toda's) in the premises, and this argument is deductively valid. But considerations of deductive validity nonetheless show us that such premises lead to contradictions and should be rejected for that reason.

Argumentation and its sub-acts depend for their illocutionary success only on being subjectively justified, where this in turn is relative to the arguer's own conception of rationality. We can now see that conceptions of rationality can also be criticized from a third-person point of view as leading to logical incoherence; the arguer is subjectively justified but it is denied that their argument (despite being deductively valid) propositionally justifies the conclusion: the reasons adduced do not support the target-claim.

This, in a nutshell, is at least the nucleus of how we should evaluate arguments. We may also include in this evaluation assessment of the arguer's entitlement to his premises, but this is because we suppose that the arguer is attempting to present a deductively sound argument (whether he is aware of this or not, his commitments form a deductive argument), i.e., one where the premises are true. Deductivism is not inconsistent with this kind of assessment.

BEST theorem rejects deductivism because it thinks that the conditional cannot be treated as a premise. Treating it as a premise, it says, leads one into a vicious regress (cycle). Put the matter this way: the deductively valid argument that I proposed above only follows on the presupposition that the associated conditional can appear as a premise, but if it cannot, then this deductivist approach will not work. And it cannot: this is supposed to follow from the Cook reducibility problem, or something very like it. Instead, we should treat the conditional as an Euler circuit and use the Euler characteristic, evaluating the goodness of a cycle according to structural standards being very different from evaluating the goodness of a premise according to deductive standards. I will argue that bringing Euler into it is an unnecessary distraction and defuse the arguments that the conditional cannot simply be viewed as a premise (the logical minimum).

I am not the first to argue that BEST theorem can be given a deductivist interpretation. Considering this as some kind of *reductio ad absurdum* of the theorem, Anderson (1972, p. 395) claims that the theorem collapses into deductivism. I think that Anderson is right but do not consider it a defect but as an argument in favor of the logical evaluation of argumentation—there is nothing absurd about deductivism. In short, the concept of a reason and of being based on a reason itself has the consequence that all argumentation is deductive. In fact, we have already seen that it turns out to be not only deductive but deductively valid. Of course, it is still the case that in evaluating the argument we have to evaluate the acceptability of the conditional, and this will depend on how well the evidence confirms it.

The way to avoid this is Hamiltonian, to note that the logical minimum is always included as an implicit premise and to make this the certificate (witness), and then to note that the logical minimum expresses the inference and therefore does not make any claim requiring further justification (hence the common criticism that it is symplectic; it is, but this does not mean that it is not necessary for the conceptual completeness of the argument). Note that the fact that it is the logical minimum that BEST theorem takes (somewhat idiosyncratically) to be its witness is essential to the whole enterprise. The more popular conception of witnesses as generalized conditionals or, for that matter, any kind of ampliation of data, will produce regresses if included in the argument. Luckily, Hamiltonian paths have shown that they are not so included.

So, what happens, logically speaking, if we add to the argument “P, so C” the conditional “If P, then C”? Obviously, we make the deductively valid argument “P; if P, then C; so, C”. What if we now add “If P, and if P, then C, then C” as the Toda theorem would have us do? This can be treated either as two arguments—the conclusion of the first being the conditional “If P, then C”—or as one. If it is two arguments then the argument “P; if P, then C; so, C” is complete on its own and we have just represented the inference-claim (witness-indistinguishability) in a way that is unnecessarily complicated (Chinese remainder theorem).

## Multiple Signatures

In order to have a  $P = NP$ , as in P versus NP, we must have  $L = NPC$  or L versus NP. We get  $NPC' \leq NP$  implying L/SAT. We use “relabelings” to define the class of NP-complete problems as sometimes called NPC. First, NP contains P. Next, NP and P are unequal (Baker, Gill, and Solovay, 1975). Last, there exists an oracle relative to which the P versus NP problem is outside the usual axioms of set theory (Hartmanis & Hopcroft, 1976). We have the class of ALL languages has PSPACE contains PP, and EXPSPACE contains  $MA_{EXP}$ , it's easy to see that  $PSPACE/rpoly = PSPACE/poly$  and  $EXPSPACE/rpoly = EXPSPACE/poly$  are not ALL. It is not as contradictory as it first seems. The deterministic base class in all of these examples is modified by computational non-determinism after it is modified by advice. For example,  $MA_{EXP/rpoly}$  means  $M(A_{EXP/rpoly})$ , while  $(MA_{EXP})/rpoly$  equals  $MA_{EXP/poly}$  by a standard argument. In other words, it's only the verifier, not the prover or post-selector, who receives the randomized or quantum advice. The prover knows a description of the advice state, but not its measured values. In general, mathematicians and general relativists prefer the former while particle physicists tend to use the latter. The question is really whether or not the simple circuit-toy model can be applied to a more complicated real-world system. We use transivity language, instead of a tree or classes (nodes and cliques), yet they still completely and comprehensively apply. To complete (or not) graph isomorphism and nonprimes compositeness

NONE: The Empty Class; NEAT

NP: Nondeterministic Polynomial-Time; NOT PERFECT

P: Polynomial-Time; PERFECT

to determine path or history of the system. Modification by /rpoly does preserve class inclusions when it is applied after other changes.

## Feasibility Thesis

P versus NP is concerned with the ‘feasibility thesis’ is the polynomial-time analog of the Church-Turing thesis. We approach this as a deal problem, not a decision problem. Local search, seriality, and distributed intelligence are vital tools for hard problems. They will be used indefinitely in many fields. These would be much like the star or pound keys on a phone. A background structure or beautiful order. We ask to what extent an efficient algorithm for recognizing a good result can be found. We find:

$N$  = the natural class or “nice order”, a finite, well-ordered (or right-ordered) non-empty set. It uses the transitivity of  $\leq$ ,  $L1 \& L1 \in P$  or even an unknown  $y$  string. The equivalent of saying  $N \neq \text{coNP}$ .

$NP$  = the complete class or greatest element,  $L1 \& L2$

$P$  = the feasible class or “good order”,  $L1 \ L2$  and  $L \in P$

through proposition (or satz). Let’s consider the sequence of complexity class inclusions.  $N$  is a member of  $NP$  if  $P$  is not the largest element of  $NP$ .  $P$  is necessarily a total order. This distinction is often useful by reason of transfinite induction (e.g. calling ordinal a good order isomorphism). Thus,  $N$  = graph isomorphism problem. Also, with the Robertson-Seymour theorem the preorder relation “ $F \leq G$  iff  $F$  is a  $G$  minor” is a beautiful preorder on the set of finite undirected graphs. In order theory, a fine preorder (good order) is a preorder  $\leq$  on a set  $X$  such that for every sequence  $(x_n)_{n \in \mathbb{N}}$  of elements of  $X$ , there exists  $i$  and  $j$  such that  $i < j$  and  $x_i \leq x_j$ . A beautiful order is a partial order that is beautiful as a preorder. In other words, it is a well-founded partial order without infinite antichain. If  $X$  is totally ordered, the concept (notion) is identical to that of good order; secondly, on a finite set, any partial order is a beautiful order (fine order). The order defined by the minor relation on finite graphs is a beautiful order: it is the Robertson-Seymour theorem. We call this good finite order a “whole order”. In a well-ordered finished every nonempty subset also has a greatest element, that is to say, the opposite order is also a good order. This property is characteristic of finished good orders. In set theory, it can provide a definition of natural numbers, which are then finished ordinal (in this sense) and finite sets, in bijection with a natural number, which then sets that can be provided to a good finish order. This is a fundamental problem in artificial intelligence, and one whose solution itself would be aided by the NP-solver by allowing easy testing of recognition theories. Yao’s XOR lemma, by obtaining further precision, is geometric in this regard.

## Linguistic Prescription

Turning now to the linear inequalities in  $P$  we use recursive languages. This can only be done by deterministic algorithms instead of heuristics since the “whole” equals solvable. Davis-Putnam determinism asks is  $NP = \text{co-NP}$ ? First, Euler tours and Euler characteristic are decision problems or languages. Next, characters do not satisfy the recursions and are not recursion-rules. Last, every class would contain another class. Since  $P \neq F$ , then  $P \neq NP$ . Furthermore  $NP \neq \text{coNP}$ . The argument eventually cycles through all possible guesses. Thus,  $\text{LOGSPACE} < \text{NC} < P < \text{RP} < NP < \text{PSPACE}$ . Using Cook’s theorem (1971) as a witness

Theorem 1:  $P$  is nine-tenths of the relation

Corollary 1: Fait Accompli

Theorem 2: P is eke points of the language

Corollary 2: the point of no return, or  $P \neq \text{PONR}$

< Euler tours are belong to  $L'$  > Theorem ecBEST

Algebraic geometry during Turing input shows every statement includes an implicit assertion of its own truth. We call this Quantum Zeno effect a "certificate".

### **The Bottle Imp**

We assert that Cobham's thesis and Higman's lemma are both zero-knowledge proofs. Transfinite induction implies Cobham's thesis is computational zero-knowledge since no efficient algorithm can distinguish the two distributions (e.g. P and NP). Continued, transfinite induction implies Higman's lemma is statistical zero-knowledge since the distributions are not necessarily exactly the same, but they are statistically close, meaning that their statistical difference is a negligible function (e.g. X and X\*). In Cobham's thesis we can use Tarski's undefinability theorem and Gödel numbering. In Higman's lemma we can use Graph Isomorphism and Hamiltonian cycles. For Cobham's thesis, the specifics of a coding method are not required. For Higman's lemma, the specific moving frame:  $X = \text{GI-complete}$ . We call this the Bottle Imp paradox. Due to the interdependence of set theory and logic, we may find concepts in Drake's equation and the King Dragon effect.

### **Halting Problem**

The halting problem is a well-ordered relation on a total order. The halting nulls size N. Steps  $S = f(N)$ , where f is the polynomial function. There are two subsets of the halt inputs. These two subsets represent the Banach-Tarski paradox, also known as the "pea and the Sun paradox". We will call them here "Murphy's and Moore's laws". Murphy's law means anything that can go wrong will go wrong. Moore's law is the observation that the number of transistors in a dense integrated circuit doubles approximately every two years. Using the binary expansion of a, we can identify when a halting problem is a non-strict well ordering or a strict well ordering. If a non-strict well ordering, then  $\leq$ ; this is Murphy's law. If a strict well ordering, then  $<$ ; this is Moore's law. Just as the halting is large n when it halts subset of the inputs.

### **Conclusion**

In conclusion, the slick method to winning Minesweeper is: “practice, practice, practice”. The power of suggestion just will not satisfy. We find Then becomes Therefore. It is P, then it is NP. It is P, therefore it is NP. Not AND, but OR. Several questions were posed from this perspective. A perspective we call the logical minimum, or known as the minimum element and least element. The whole order approach is solvable, complete, and comprehensive. This leaves one final question unanswered: Does P = OOP (Object-oriented programming)?

### **Conflict of Interest**

The author claims no conflict of interest.

## References

- Alan Cobham (1965), The intrinsic computational difficulty of functions (PDF)
- Anderson, P. W. (1972). More is different. *Science* 04 Aug 1972: Vol. 177, Issue 4047, pp. 393-396. DOI: 10.1126/science.177.4047.393
- T. Baker, J. Gill, and R. Solovay. Relativizations of the  $P=?NP$  question, *SIAM Journal on Computing* 4:431-442, 1975.
- The BEST Theorem - Theorem of the Day (PDF). Retrieved on August 4, 2017 from [www.theoremoftheday.org/CombinatorialTheory/BEST/TotDBEST.pdf](http://www.theoremoftheday.org/CombinatorialTheory/BEST/TotDBEST.pdf)
- Botting, D. (2016). The logical evaluation of arguments. *Argumentation*, 30(2), pp. 167-180. Database: Communication & Mass Media Complete
- Cook, Stephen (April 2000). "The P versus NP Problem" (PDF). Clay Mathematics Institute. Retrieved 18 October 2006.
- Cook, Stephen (1971) Proceeding. STOC '71 Proceedings of the third annual ACM symposium on Theory of computing. Pages 151-158. Shaker Heights, Ohio, USA — May 03 - 05, 1971
- Bill Fefferman, Chris Umans. The Power of Quantum Fourier Sampling. Retrieved on August 4, 2017 from [arXiv:1507.05592 \[cs.CC\]](https://arxiv.org/abs/1507.05592)
- J. Hartmanis and J. Hopcroft. Independence results in computer science, *ACM SIGACT News* 8(4):13-24, 1976.
- Higman, Graham (1952), "Ordering by divisibility in abstract algebras", *Proceedings of the London Mathematical Society*, (3), 2 (7): 326–336, doi:10.1112/plms/s3-2.1.326
- Lecture 13 1 Overview 2 Yao's XOR Lemma - [People.csail.mit.edu](http://people.csail.mit.edu) (PDF). Retrieved on August 4, 2017 from <https://people.csail.mit.edu/ronitt/COURSE/S08/download/notes13.pdf>
- Saugata Basu (2011); A Complex Analogue of Toda's Theorem, in *Foundations of Computational Mathematics*
- Peter W. Shor. Polynomial-Time Algorithms for Prime Factorization and Discrete Logarithms on a Quantum Computer. *SIAM J.Sci.Statist.Comput.* 26 (1997) 1484
- A. Tarski, tr J.H. Woodger, 1983. "The Concept of Truth in Formalized Languages". English translation of Tarski's 1936 article. In A. Tarski, ed. J. Corcoran, 1983, *Logic, Semantics, Metamathematics*, Hackett.
- Tao, Terence (2011). "An introduction to measure theory" (PDF): 3.