Fuzzy time and possible impacts of it on science [16], **GENERALIZATION**

Bi-Theory Method & Navier Stock Problem

Farzad Didehvar

didehvar@aut.ac.ir

Amir Kabir University of Technology (Tehran Polytechnic)

23June 2024

Abstract. Here , we try to show the method which is used in [2] is a general method which shed light on different various types of problems. The author choose navier stocks problem, to check the possibility of solving this problem by this method.

Actually, this text is a guideline of a possible proof of this problem.

Keywords. *Bi-theory method, Navier Stock problem, Fuzzy time, P vs NP problem, Tao bilinear operator*

In [2] we use fuzzifying time as a method to conclude $TC + CON(TC^*) \vdash P \neq NP$. Here, firstly we introduce

the generalization of this method, we call it bi-theory method. The special case of this method is applying fuzzy time to have the second type of models as we see in [2]. We show the possibility of solving Navier Stock problem by this method. We wish to present bi-theory method as an approach to different various type of problems.

We are able to demonstrate the method which is applied in [2] by following simple lemma.

LEMMA. **For any two theories** T, T^* and $\in T$, suppose that there exists φ, P^*,

$\varphi: T \to T^*$; $\varphi(P) = P^*$;

$T^* \vdash P^* \quad \to T + CON(T^*) \vdash P$.

Now if $T^* \vdash P^*$ we have $T + CON(T^*) \vdash P$.

The above simple lemma shows the method.(Bi theory method).

In our examples, the theories more specifically are $T = TH(M)$, $T^* = TH(M^*)$. In this case, the bi-theory method is called here bi-model method.

In [2], we considered TC , TC^* as our two chosen theories, we associate to any statement and formula φ, its fuzzy form. In brief, in any term t we have in TC , we replaced it by t^*.

In special case, if $\mathrm{T} = \mathrm{TC}$, $\mathrm{T} = \mathrm{TC}^*$ we have fuzzifying time method.

Navier Stock problem

We studied the impact of fuzzy time on PvsNP problem [2]. Seemingly, Bi theory method is more convinient for Navier stock rather PvsNP problem. Here, we present the reasons of this claim. To do this, we study Terrance Tao paper [1] and the Major results of it. Before this we quote a version of Navier Stocks from [1]. page 3

Conjecture 1.2 (Navier-Stokes global regularity, again, quoted in [1]). Let
$u_0: R^3 \to R^3$ *be a divergence-free vector field in the Schwartz class. Then there exists a*

mild solution $u: [0, \infty) \to H^{10}_{df}(R^3)$ *to the Navier-Stokes equations with initial data* u_0.

Here, we call the above Navier-Stokes conjecture, as NS.

The numbers used in the above lemma and following theorem are the numbers in the article [1].

Theorem 1. (Finite time blowup for an averaged Navier Stokes equation, quoted in [1]). There exists a symmetric averaged Euler bilinear operator $\tilde{B}: H^{10}_{df}(R^3) \times H^{10}_{df}(R^3) \to H^{10}_{df}(R^3)^*$
Obeying the cancellation property (1.16) for all $u \epsilon H^{10}_{df}(R^3)$, *and a schwarts divergence free vector field* u_0, *such that here is no global-in-time mild solution*

$u: [0, +\infty) \to H^{10}_{df}(R^3)$ *to the averaged Navier-Stokes equation (1.9) with initial data* u_0.

Definition. Tao bilinear operator is a bilinear operator which satisfies the conditions in above theorem.

We need a lemma to show the above assumption is equivalent to the normal form of NS

when, we have a specific fuzzy time. We call it NS^{*_1}, in contrast to NS^* for fuzzy time in

general.

Conjecture*. There is a Tao bilinear operator u, respect to it, there is a fuzzy time

Function v_u, such that solving Navier-*Stokes equation* by it, is equivalent to have a

solution for the associated tao equation for u.

The existence of v_u in above is called NS^* .By Conjecture* and the above theorem, it is

failed to be true.

Theorem2. By Conjecture* & Theorem 1, NS fails to be true.

Discussions around and about the Proof of the above theorem.

To apply a similar strategy which we used in PvsNP problem we should remind

that, one of the key points in that proof is $P = NP$ is equivalent to $P^* = NP^*$.

The above theorem besides the existence of random generator in fuzzy time provides a situation allow us to apply the method. Analogously, to apply the method for Navier Stock theorem. In the sequel, we give the hint of

proof

1. The first is about Navier Stock theorem in real time and fuzzy time.
   Here, we have two versions of it.
   In real time, we represent the version of this theorem by NS and in Fuzzy time NS^{*} (and NS^{*_1}).
   We need to prove

   $$(NS \to NS^{*_1})$$

   Similar to $P \neq NP \to P^{*} \neq NP^{*}$.
   (Or for the specific fuzzy time related to the Conjecture* $NS \to NS^{*}$).
   Actually, we prove $\sim NS^{*_1} \to \sim NS$.

   Similar to the proof of $TC + CON(TC^{*}) \vdash P \neq NP$ [2] which we apply fuzzy time, in the new proof , from $\sim NS^{*_1}$ we have different possible worlds. One of them is Classical world with classical time. So $\sim NS$ comes true by similar technic in proof of $TC + CON(TC^*) \vdash P \neq NP$ [2]. If the above claims hold, the bi-theory method shows the NS fails to be true.

Now, by the Conjecture*, and major theorem (theorem 1) we have $\sim NS^{*_1}$. This and the above result implies $\sim NS$. □

As the major result of this article, by proving the Conjecture*, we prove Navier-Stock conjecture.

Comment. The usage of Fuzzy time in solving some paradoxes first was introduced in 2018 in Shiraz Conference of Mathematics [5] and in a series of papers the author tries to show the impact of these hypothesis on Theory of computation and Physics. In this topic, we have two aspects. First , fuzzy time as a physical reality and the second as a mathematical method. Here, we consider the second approach. We have results about some problems

in Complexity Theory like P vs NP. It is shown by Shoenfield, problems like P vs NP is not solvable by

Forcing method (Shonfield absoluteness, thank the individual who reminds me that.)

. Also, it is welknown that the methods like Paralization, Algebrization and natural proofs are not able to solve this problem. This makes the methods used in [2] more

interesting.

In the first chapter, we try to generalize the method, in the second chapter

we use the fuzzy time method as an approach to attack the other type of

problem, the Navier Stock conjecture. It is a part of an attempt, a brief of

story is written in the last comment of [2]. In [2], also in [3],[4],[5] is shown how the

author reachs the idea of fuzzy time from 2018-2019 or as some friends proposed

recently "Temporal Continuum" [].

By the way, the author faces a morality problem:

if in some texts they don’t reference you in a subject, must you reference them in the same subject? Does the answer depend on the case?

Reference

1. Terence Tao, FINITE TIME BLOWUP FOR AN AVERAGED THREE-DIMENSIONAL NAVIER-STOKES EQUATION, arXiv:1402.0290v3 [math.AP] 1 Apr 2015
2. Farzad Didehvar, Theory of Fuzzy Time Computaion (TC^* vs TC, TQC), hal-0433081
3. Farzad Didehvar, Is classical Mathematics appropriate for Theory of Computation?, 2017, Vixra, Phillpapers 2019
4. Farzad Didehvar, Zeno Paradox, Unexpected Hanging Paradox (Modeling of Realiity & Physical Reality, a
5. Historical-Philosophical View), 2022,SSRN
6. Farzad Didehvar, Fuzzy Time, from Paradox to Paradox, December 2019, Philpapers, The article is presented in 50th Annual Iranian Conference of Mathematics.