ABSTRACT:
Time Travel is Fictitious for past hundreds of year when the science came into the picture. The man had not achieved his dream about time travel. Time Travel is Mythological up to now may be going to be real in Future. The main theme of the paper is to give General introduction to time travel regarding less the theories which are proposed by the eminent scientists. The main Concept of the paper revolves around Actor and Audience Theory. Actor and Audience theory is comes under the subject of theoretical Physics and based on travelling time of the object. This theory resists Grandfather Paradox and Great man theory.

Key Words: Infinite Time Space, Forward Time Travelling Function, Backward Time Travelling Function, Forward Time Space Path, Backward Time Space Path, Time Travelling Portal

Introduction

Definition of Time Travel: Time Travel nothing but travelling of an object or matter from one instant of time to another instant of time.

Actor and Audience theory is based on Cinema concept and how the object is going to take place of Actor or Audience. Let a Drama is playing in a theater. Actor performs the actions physically as per the script respectively and an Audience sees and enjoys the Action performed by the actors but not physically involves in the Drama. Let us assume that a Object is going to take Time Travelling in a Time Machine

Definition of Time Machine: A vehicle that would be used to achieve time travel.

The object travels in a Infinite Time Space \(^{[1]}\) in the universe without any obstruction and with the speed of light or even faster than light \((c = \text{3x10}^5 \text{ km/sec})\) on Forward Time Space Path\(^{[4]}\) or Backward Time Space Path\(^{[5]}\) to reach the destination time. The Paths must be closed paths

Infinite Time Space: It is the space in the universe to travel between different time intervals

Forward Time Space Path: It is the path between present time instant or past time instant to future time

Backward Time Space Path: It is the path between future time instant to present time instant or past time instant in the Infinite time space
In the author point of view

- Past is a Recorded Data
- Present is Real Data and
- Future is Imaginary Data along with the time.

We can manipulate the present and future data but not past data. Example: We can do activities like in present and future however we want but never change the past. Simply the things or activates happened in the past like data stored in non rewritable disk (VCD or DVD).

**Actor and Audience Theory**

The travelling path of the object must be closed path and the object position should not be changes for closed path.

**2.1. Actor Theory**

In this Theory the age of object or matter which is going to be travelled in the time Space is physically changes while time travelling and the time travelling period is limited to certain limits.

Properties of the Travelling Object in the Time Space

- The age of the object changes physically and mentally along with is time travel
- The object can travel within the limits of Birth Time and Death Time on closed paths.
- Beyond these limits the object never exists.
- The closed path radius and circumference is proportionally increases with time.
- The object can manipulate the Future and Past.

Example 1: Assume that a man age of 22 years old can live 78 years and going to travel in time machine on between 22 years past and 78 years future on Backward Time Space Path and Forward Time Space Path respectively. The object identity beyond these limits is zero or not exists

**2.1.1. Forward travel (Future)**

The maximum length of the Forward travelling closed path in the space is

\[ L_{ftt\ max} = C\int_{t_0}^{t_+} \Phi(t+\ dt) \ km \ ... \ (i) \]

The maximum Diameter of the closed Forward travelling path is

\[ D_{ftt\ max} = \frac{C}{\Pi}\int_{t_0}^{t_+} \Phi(t+)\ dt \ km \ ... \ (ii) \]

For \( t_0 < t < t_+ \)

\[ L_{ftt\ max} = D_{ftt\ max} = 0 \ \ for \ \ t < t_0 \ and \ t > t_+ \]

Where, \( t_0 = \) starting time = 0
\( t_+ = \) future time = 78
$c =$ velocity of light $ = 3 \times 10^5 \text{ km/s}$

Substituting in equation (i) and (ii)

$L_{\text{fit max}} = 3 \times 10^5 \int_0^{78} 1 \, dt = 3 \times 10^5 \times (78 - 0) = 78c$ km.

Figure 1: the object from starting point-X can travel $t+$ yrs future with a speed of light or even faster than light, $c = 3 \times 105 \text{ km/s}$.

2.1.2. Backward travel (Past)

$\Phi(t+) = \text{Forward Time Travel Function } = 1$

The maximum length of the Backward travelling closed path in the space is

$L_{\text{btt max}} = C \times \int_{t_0}^{t} \Phi(t+) \, dt \text{ km} \ldots \ldots (\text{i iii})$

The maximum Diameter of the closed Backward travelling path is

$D_{\text{btt max}} = (C/\pi) \times \int_{t_0}^{t} \Phi(t+) \, dt \text{ km} \ldots \ldots (\text{i iv})$

For $t chảy t < t_0$

$L_{\text{btt max}} = D_{\text{btt max}} = 0$ for $t < t_0$ and $t > t_0$

Where, $t_0 =$ starting time $ = 0$

t_0 = future time $ = -22$

c $= \text{velocity of light } = 3 \times 10^5 \text{ km/s}$

$\Phi(t+) = \text{Backward Time Travel Function } = 1$

Substituting in equation (iii) and (iv)

$L_{\text{btt max}} = 3 \times 10^5 \int_{-22}^{0} 1 \, dt = 3 \times 10^5 \times (0 - (-22)) = 22c$ km.

$D_{\text{btt max}} = 3 \times 10^5 \int_{-22}^{0} 1 \, dt = 3 \times 10^5 \times (0 - (-22)) = 22c/\pi$ km.

Figure 2: The diameter of most inside circle is D1 and most outside circle is Dn. The figure is the forward time travelling path distances for different diameters.
Figure 3: the object from starting point-X can Travel t. yrs future with a speed of light, $c = 3 \times 10^5$ km/s.

Figure 4: The diameter of most inside circle is $D_1$ and most outside circle is $D_n$. The figure is the backward time travelling path distances for different diameters.

2.2. Audience Theory

In this Theory the age of object or matter which is going to be travelled in the time Space is physically constant while time travelling and the time travelling period is limited to certain limits.

Properties of the Travelling Object in the Time Space

- The age of the object does not change along with time travel
- The time travel object has no limits on closed paths.
- The closed path radius and circumference is proportionally increases with time.
- The object cannot manipulate the Future and Past.

The object experiences like watching a movie in cinema hall.

The equations for forward and backward time travel is same as the equations (i) (ii) (iii) and (iv) with the limits of $+\infty$ and $-\infty$. The equations are
2.2.1. For forward time travel

The maximum length of the Forward travelling closed path in the space is

\[ L_{\text{ftt max}} = C \int_{t_0}^{t_+} \Phi(t+) \, dt \text{ km} \]

The maximum Diameter of the closed Forward travelling path is

\[ D_{\text{ftt max}} = \frac{C}{\pi} \int_{t_0}^{t_+} \Phi(t+) \, dt \text{ km} \]

Note: \( t_0 = 0 \) and \( t_+ = \infty \), rewriting the equation

\[ L_{\text{ftt max}} = C \Phi(t_+ \int_{t_0}^{t_+} dt) \text{ km} \]  

\[ D_{\text{ftt max}} = \frac{C}{\pi} \Phi(t_+ \int_{t_0}^{t_+} dt) \text{ km} \]

2.2.2. For backward time travel

The maximum length of the Backward travelling closed path in the space is

\[ L_{\text{btt max}} = C \int_{t_0}^{t_-} \psi(t+) \, dt \text{ km} \]

The maximum Diameter of the closed Backward travelling path is

\[ D_{\text{btt max}} = \frac{C}{\pi} \int_{t_0}^{t_-} \psi(t+) \, dt \text{ km} \]

Note: \( t_0 = 0 \) and \( t_- = -\infty \), rewriting the above equations

\[ L_{\text{btt max}} = C \Phi(t_- \int_{t_0}^{t_-} dt) \text{ km} \]

\[ D_{\text{btt max}} = \frac{C}{\pi} \Phi(t_- \int_{t_0}^{t_-} dt) \text{ km} \]

Note: The Figures are also same for the audience theory with \( \infty \) limits.

Note: \( \psi(t) \) and \( \Phi(t) \) is taken as one for there is no change in object location from present to past or future.

Generalized diagram for Time Travel between different instants of time.

Let 3 time instants past, present and future named as \( f \), \( g \) and \( h \) respectively after travelling the object its required distance. The Times are \( t_- \), \( t_0 \) and \( t_+ \) for past present and future times.

The distance of closed path between two times in forward time travel.

\[ f = C \Phi(t_- \int_{t_0}^{t_-} dt) \]

\[ g = C \Phi(t_0 \int_{t_0}^{t_+} dt) \]

\[ h = C \Phi(t_+ \int_{t_0}^{t_+} dt) \]

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\[ f(past) = C^* \int_{t_0}^{t^-} \Phi(t^+) dt \]
\[ g(present) = C^* \int_{t}^{t_0} \Phi(t^+) dt \]
\[ h(future) = C^* \int_{t}^{t^+} \Phi(t^+) dt \]

The distance of closed path between two times in backward time travel.

Figure 5: Time travelling diagram between past, present and future.

In figure 5, The distance of closed path between two times in backward time travel, the values \( t^+ \), \( t_0 \) and \( t^- \) taken as positive values but in equation ( iii ) ( iv ) (vii) and ( viii ) taken as negative values. From positive to negative values for the limits of integration interchanges vice versa.

**Important points**

1) The travelling path must be closed to reach time in past or future for same location.
2) If the travelling path is not a closed path we may lost in the universe because earth surface is very small as compared to universe.
3) The equations are linear and not implemented in real world because we do not have required apparatus to take time travel.
4) The time travelling portal must be created.

Time Travelling Portal: is a starting point of the time travel of the object’s machine to take time travel. The object’s machine travel through this portal with light or even faster than light velocity covered by required distance to reach the destination time.

**Opposing Theories**

3.1. Opposition to Grandfather Paradox

The grandfather paradox is a proposed paradox of time travel first described by the science fiction writer René Barjavel in his 1943 book *Le Voyageur Imprudent ( Future Times Three )* . The paradox is described as following: the time traveler went back in time to the time when his grandfather had not married yet. At that time, the time traveler kills his grandfather, and therefore, the time traveler is never born when he was meant to be.

By the Actor – Audience Theory

- If the traveler travelling as actor he can travel back up to his age and he never kills his father because there is no value presents when crossed his age.

If the traveler travelling as a audience he has no rights to change the past as well as future, i.e., no killing of his grandfather takes place.
• **Opposition to Great man Theory**

The Great Man theory is a 19th-century idea the impact of "great men", or heroes: highly influential individuals who, due to either their personal charisma, intelligence, wisdom, or political skill utilized their power in a way that had a decisive historical impact. The theory was popularized in the 1840s by Scottish writer Thomas Carlyle.

By the Actor – Audience Theory

• If the Grate man presents in the period of traveler traveler can go back and kill the great man. Let us assume the author going take time travel but he’s mind also changes with respect to time so intentionally never changes but he continuous living as he lived in the past.

If the traveler travelling as a audience he feels like watching story of great man. But no manipulation in physical acts.

**CONCLUSION:**

Time travel is Fictitious or mythological or imaginary concept in real word. Actor – Audience theory is come under theoretical physics subject and not used warm holes or block holes concept in the theory. According Actor – Audience theory Time Travel exists but we cannot change the past but we can change the future however we want. While travelling past the object physical and mental states changes along with the time and the object lost the idea of what he wants do in past. If the Object wants to travel to future the object memory can store the memory what he wanted do in past.

According to this theory Grandfather Paradox and Grate man Theory are not real and never applicable in physical world.

Sir Einstein: If the object travels with the speed of light or even faster than light that object age is constant in infinity space of time.

Prof Stephen Hawking: time travel might only be possible in a region of space time that is warped in the correct way, and that if we cannot create such a region until the future, then time travelers would not be able to travel back before that date.

**Influenced Time Travel stories:**

• the Mahabharata mentions the story of the King Revaita, who travels to heaven to meet the creator Brahma
• Washington Irving's 1819 story "Rip Van Winkle" tells of a man named Rip Van Winkle who takes a nap on a mountain and wakes up 20 years in the future
• the Japanese tale of "Urashima Tarō", first described in the Nihongi (720)

• Sleep was also used for time travel in Faddey Bulgarin's story "Pravdopodobnie Nebylitsi" in which the protagonist wakes up in the 29th century

• Louis - Sébastien Mercier's L'An 2440, rêve s'il en fût jamais ("The Year 2440: A Dream If Ever There Were One")

APPLICATIONS

• In Hindu Mythology a real story about Pothuluru Veerabrahmendra Swamy is a saint, "Future predictor" and astronomer in the 17th century. He is the author of 'Kaala Gnanam' which is the work of chanting poems with future predictions. More than 90% of the world is running on his 'Kaala Gnanam'

• If time travel is possible we cannot change the past according to actor – audience theory but we can change the future like Migrating animals and persons from affected areas of Natural Disaster. Providing extra Military and Police protection at the borders of nations when terrorists trying to cross the borders in future. We can have ability to change the future by actor theory. We can know by audience theory What are asteroids going to be hit the surface of the earth in the future and we will take necessary precautions. In The Medicine, we can find out the Formulas of chemicals for curing the diseases like HIV / AIDS by watching the future in present time because at one time in the future the formula of the disease is founded and so on.

• Reason for no manipulation of future: in the Hindu religion, Lord Brahma is the Creator of the universe. He wrote the future on forehead of human body and as per his words he acts. Even he has no power to change what he was written. This is the best example for the past is a recorded data.

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