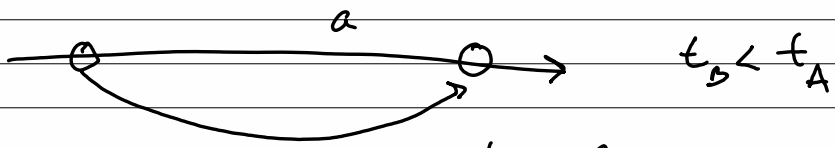
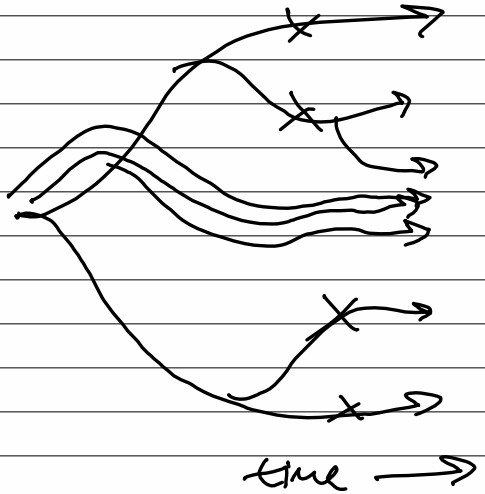
relativistic time travel

only forward



no possible histories, just one over & over



consistent
i.e., no change

past & future are fixed

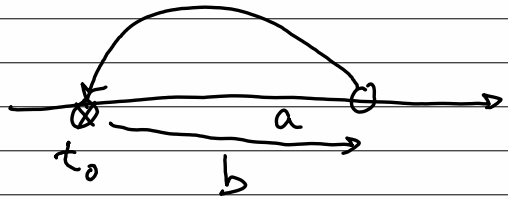
block universe

two types of "time travel"

① self-consistent ⇒ you were there in past, no changes

② changed history → free will? do-over?

self-consistent



super deterministic

only one path

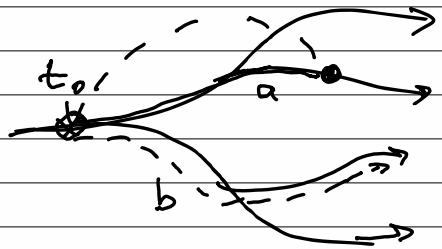
No free will

a goes back to t_0, becomes time twin, b

a/b versions were both there in past

but b makes no "changes", history to same

changed history



a goes back to t_0, becomes b

↓

do-over travel

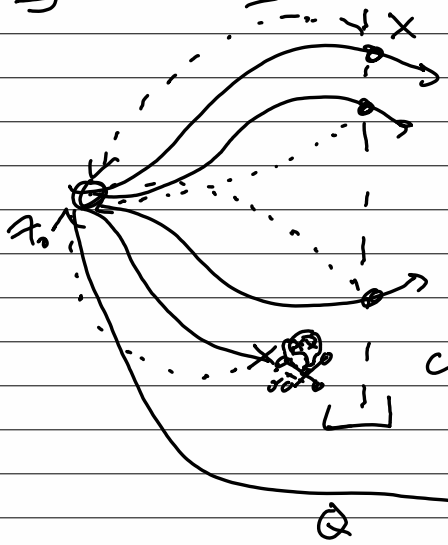
↓

time traveler b has ability to alter events

new timeline, does original still exist "out there" in parallel universe?

OR is old path "destroyed"

ground-hog travel



at point X return to t_0

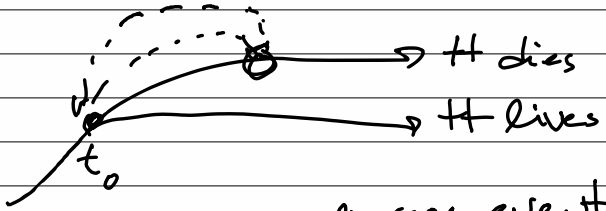
time trap, loop always the same, but traveler makes choices

until correct choice & history Q found

fine

do not meet self in past, each path is new

Christmas Carol time travel (do-over)



H = tiny Tim

only sees events of future, no travel

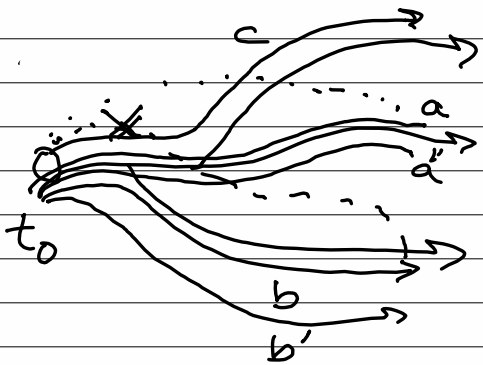
each return to t_0 makes new timeline, you do not meet yourself in past

twin histories

c twin, no free will

b twin, choice

(time robot)



a returns, become b, sees a' do all a's action and return in time. b does new actions returns to become c, who sees a' & b' until X.

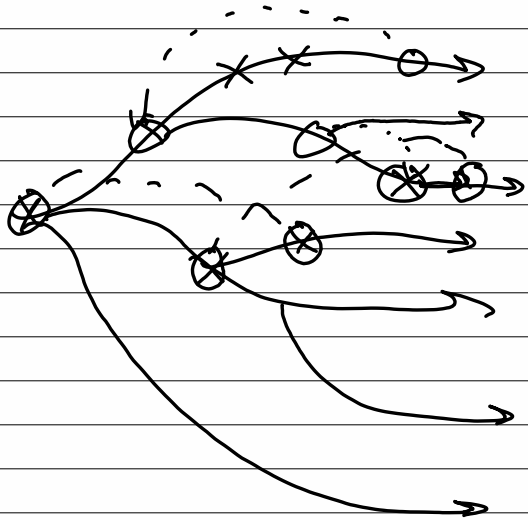
travel to past duplicates traveler as a time robot, who acts out all events in previous return

free will only to latest traveler

c unable to alter a or b actions?

multiple history

act of time travel forces new history

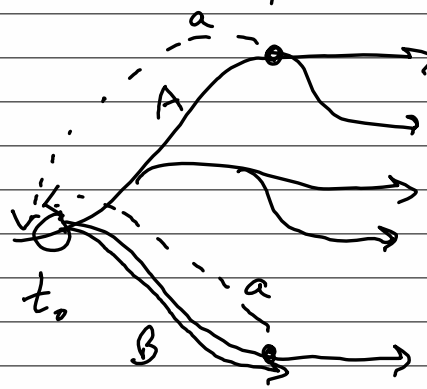


history progresses different

each travel back forces new line

jumps to previous jump points erases previous history

looped history

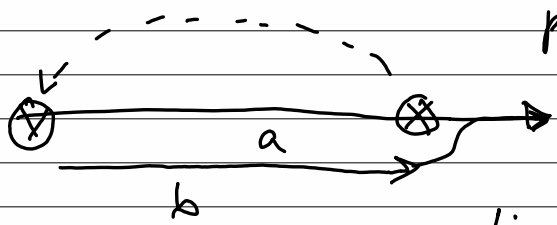


a returns to t_0, forces new path B & a goes back at same point

A memories replace a's in B path

changes @ t_0 wrap into B × A

Memory reload history



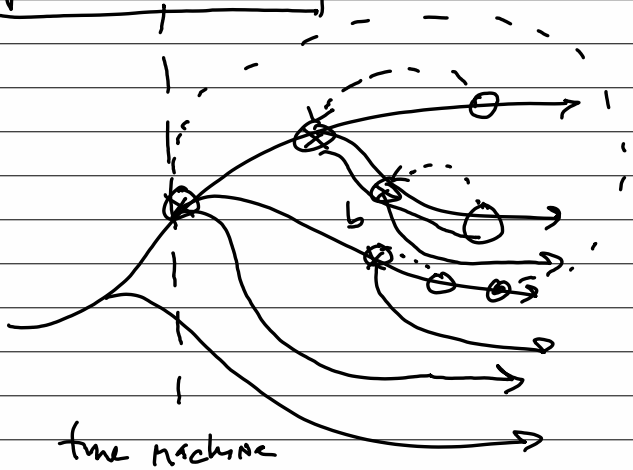
b has memory of past events,

but does not/ can not act

time protection cause history protected even w/ knowledge "already happened"

therefore can not change

prime history



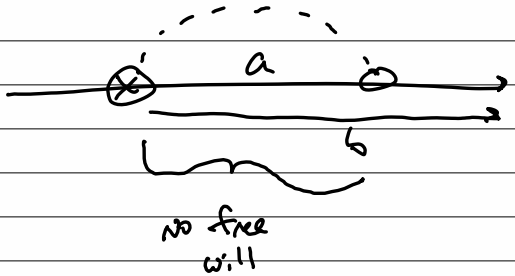
loops in hop.

travelers interact

takes time to travel to past

only travel back to time machine origin

no-generation history



two sets a & b

a no free will

b must do actions to not change past

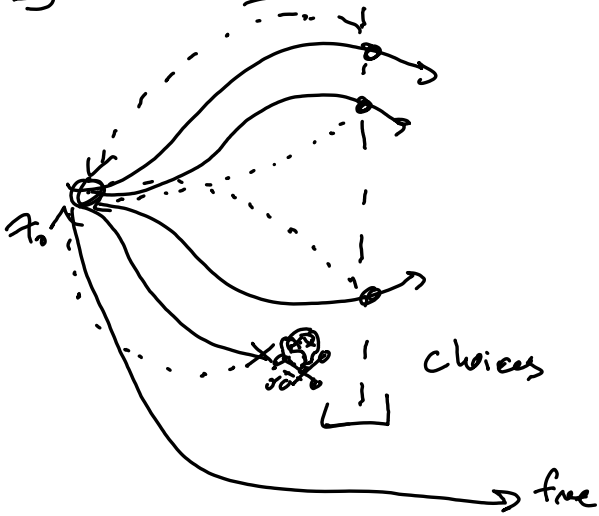
rules → logical consistency, no conservation laws

b is a, trapped in a's CONSCIOUSNESS

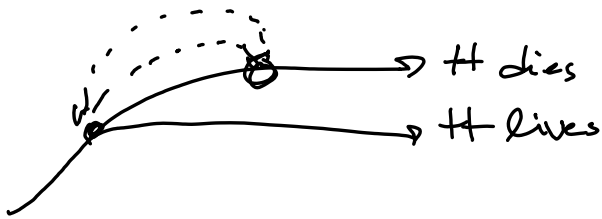
aspects to consider

(1) conservation laws
(2) paradox
(3)

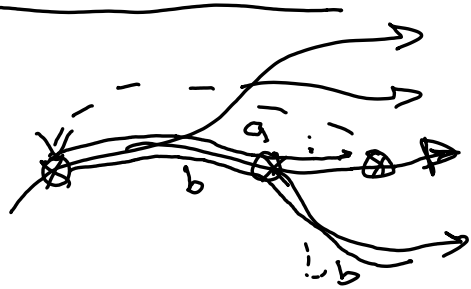
ground-hog travel



Christmas Carol travel (do-over)



twin histories

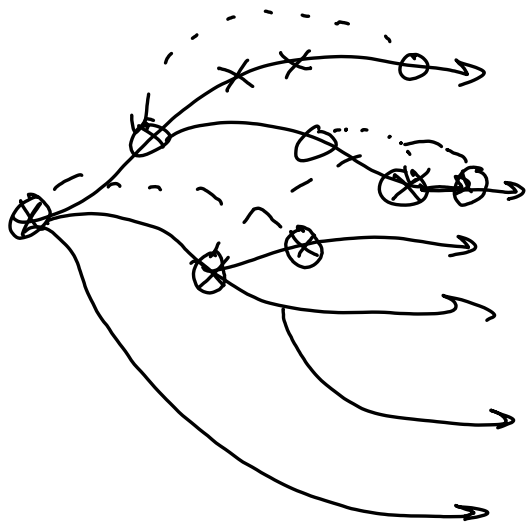


c twin, no free will

b twin, choice

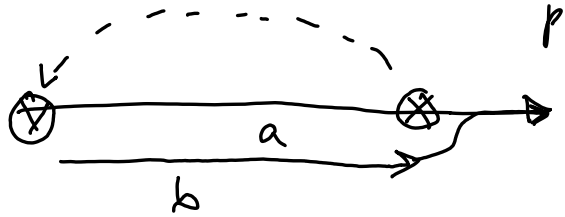
(time robot)

multiple history, act of time travel forces new histore



history progresses different

memory reload history



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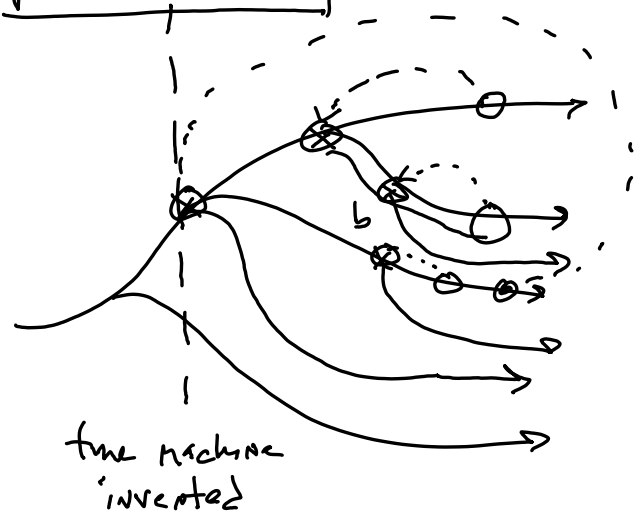
but does not act

prime history



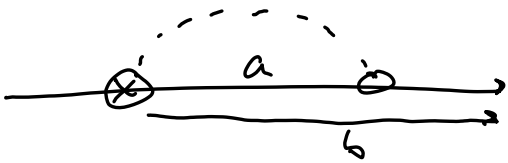
loops in hop.

travelers interact

(takes time to travel)

(only travel back to time machine)

no-generation history



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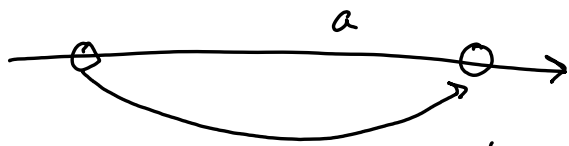
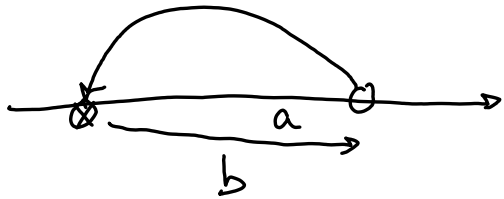


$v \simeq c$, time slows

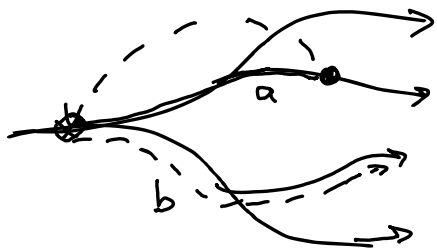
self-consistent

super deterministic



no free will

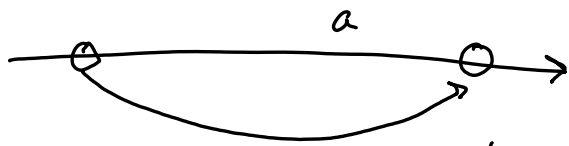
changed history



do-over travel

relativistic time travel

only forward



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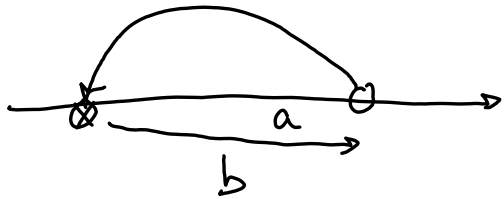

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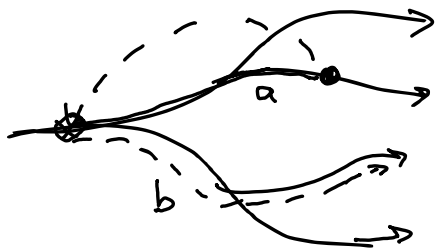

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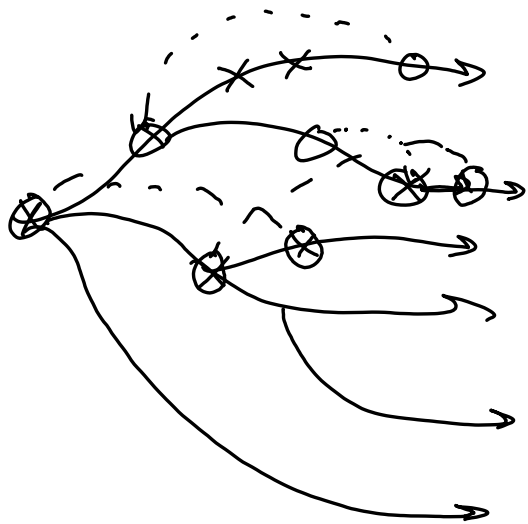

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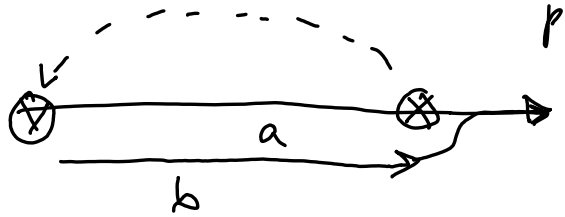

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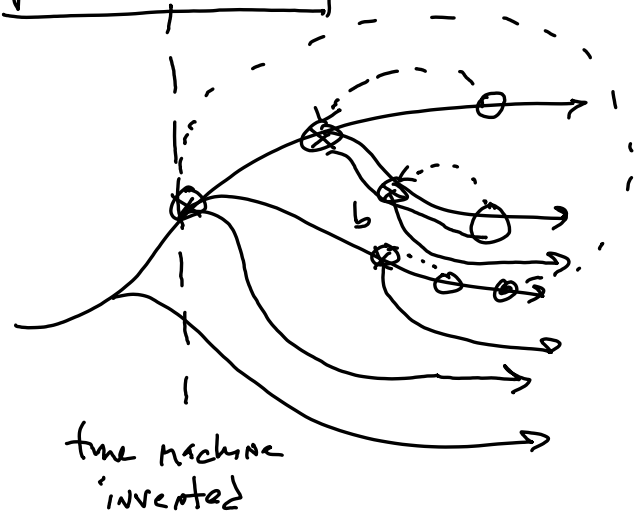

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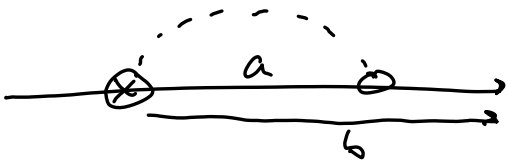

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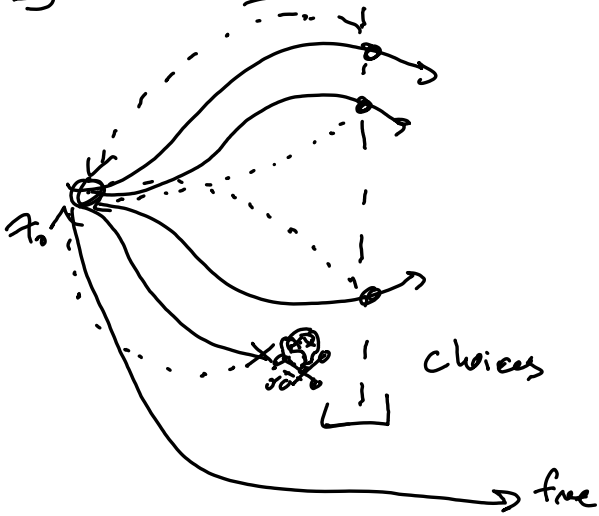

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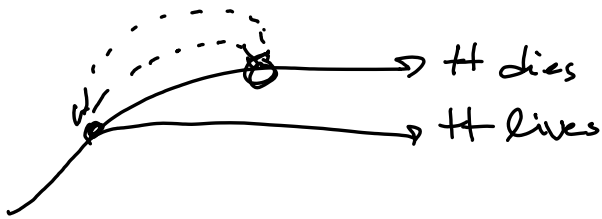

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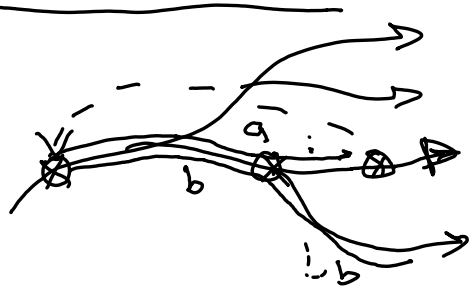

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