Time Dimensions

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Abstract: It has been shown that every space(time) has at least one time dimension. The number of time dimensions can be bigger than one.

One time dimension can exist: real or exactly complex for v > c.
It is not true that each spacetime has 1 and only 1 time dimension [1].
Two time dimensions can exist represented by the complex number
$t = t_1 + it_2 \quad (t_1, t_2 \in R\,,\ v \in Z)$. [2]
However, yet more time dimensions can exist, for example in the 10-dimensional spacetime the type (1,9) or (5,5). [3]
Theoretically there cannot be even one time dimension the type
$ds^2 = x_1^2 + x_2^2 + x_3^2 + x_4^2 + x_5^2$ (1)
The Megaverse can have only one time dimension.
Really?
Let us take under consideration (1).
There is metric $(+ + + + +)$ so there is not time. It means that there is not the velocity so as the motion, next, Relativity is not valid and the equiponderance charge-time (because simply there is not the time). Do we really have such strange spaces?
Let us take:

$x_1^2 = a \quad a \geq 0$

or $x_1^2 = a \quad a < 0$

so:

$x_1 = \pm\sqrt{a} \in R$

or $x_1 = \pm i\sqrt{a}$

So we have nevertheless the time dimension, although a need not be negative.

Another possibility:

$$x_1 = ia_x + ja_y + ka_z \qquad a_x, a_y, a_z \in R\,.$$
$$i^2 = j^2 = k^2 = -1$$
$$ij = -ji,\ jk = -kj,\ ik = -ki$$

So $x_1^2 = -a_x^2 - a_y^2 - a_z^2$

Because all: a_x, a_y, a_z cannot be simultaneously equal zero.
So $x_1^2 < 0$ even if $a_x < 0$, $a_y < 0$, and $a_z < 0$.
Generally, we have together 20 dimensions, in which 15 time dimensions.

References:

[1] A certain undereducated authority
[2] Nuclear Physics B 340 (1990) p. 33-55,
"Superstrings and Soliton" A. Dabholkar, G. Gibbons, J. A. Harvey, F. Ruiz Ruiz
(At last a certain complete publication)
[3] E. Witten, One of His Great articles