# Re: bijection of R: R <−−> Rx.....xR

***Source:*** http://sci.tech−archive.net/Archive/sci.math/2005−09/msg01901.html


- *From*: ullrich@xxxxxxxxxxxxxxxx (David C. Ullrich)


- *Date*: Thu, 08 Sep 2005 17:53:33 GMT


On 8 Sep 2005 10:22:24 −0700, "Timothy Golden
http://www.BandTechnology.com <tttpppggg@xxxxxxxxx> wrote:

>
>David C. Ullrich wrote:
>> On 7 Sep 2005 10:21:28 −0700, "Timothy Golden
>> http://www.BandTechnology.com <tttpppggg@xxxxxxxxx> wrote:
>>
>> >Does anyone reject this method on philosophical grounds?
>> >The digits are merely a representation of a real number,
>> >not the real number itself. A value (a) and (b) in the reals
>> >would seem more valid, and a function defined mathematically:
>> > c = f ( a, b ).
>>
>> First, it seem like _you_ are wrongly rejecting something
>> on philosophical grounds: Although it turns out it doesn't
>> quite solve the problem, if it did solve the problem there
>> would be nothing wrong with defining a function f(a,b) in
>> terms of the decimal digits.
>>
>> >This thing you guys are doing is sort of a three tape Turing solution.
>> >Yes it works but where is the purity?
>> >How about a swirl where
>> > t = c
>> > r = c d
>> >where t is theta and r is radius.
>> >now a = r cos t
>> >and b = r sin t
>> >Within a delta related to d there will be a range of c that matches for
>> >any a and b.
>> >If more accuracy is needed then drop d.
>>
>> First, I don't follow your definition at all. But more important,
>> it seems clear that you're _not_ defining a function! You say do
>> this, then you get a _range_ of c, if more accuracy is required
>> do something else...
>That is the epsilon−delta method of thinking isn't it? This is at the
>foundation of real analysis.

Uh, thanks. I understand real analysis very well. The formulas
above do not define a bijection from the plane to the line,
or in the other direction.

Something that has a range coming close to every point in a set
is not a mapping _onto_ that set. Saying "this is the epsilon−delta
method of thinking" does not change that fact.

>When you prove that for any range delta
>you can choose an epsilon that suffices you have proven the general
>situation. However small you want the error that sets d in the swirl
>construction above. Choosing d = 1 gets a swirl emanating from the
>origin passing through 1,2,3,... on the complex plane. Based on a
>single unsigned continuous value two real values can be generated(with
>error). It is the simplest space filling curve.

A spiral is not a space−filling curve at all.

And in fact it's very easy to see that a bijection from
R to RxR _cannot_ be continuous. So those formulas above
can't possibly be right.

>Whether the approach
>can be generalized to three real values(3D) I'm not sure.
>>
>> To define a function f(a,b) you need to say exactly what f(a,b)
>> _is_ (which the definition in terms of digits does!), not what
>> it might be, or what it is approximately.
>>
>> >Does this approach work for 3D?
>> >I don't see it.
>> >
>> >−Tim
>>
>>
>> **********
>>
>> David C. Ullrich
>

David C. Ullrich

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- ***Follow−Ups***:
  - ♦ ***Re: bijection of R: R <−−> Rx.....xR***
    - ◊ *From:* Timothy Golden http://www.BandTechnology.com

- ***References***:

- ***bijection of R: R <−−> Rx.....xR***
  - *From:* Timothy Golden http://www.BandTechnology.com
- ***Re: bijection of R: R <−−> Rx.....xR***
  - *From:* Peter Webb
- ***Re: bijection of R: R <−−> Rx.....xR***
  - *From:* David C . Ullrich
- ***Re: bijection of R: R <−−> Rx.....xR***
  - *From:* Timothy Golden http://www.BandTechnology.com
- ***Re: bijection of R: R <−−> Rx.....xR***
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  - *From:* Timothy Golden http://www.BandTechnology.com


- Prev by Date: ***Re: infinity***
- Next by Date: ***Re: No homeomorphism (0,1) <−−> [0,1]***
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