Package 'binomialcftp'

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Type Package

Title Generates binomial random numbers via the coupling from the past algorithm

Version 1.0

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Description Binomial random numbers are generated via the perfect sampling algorithm. At each iteration dual markov chains are generated and coalescence is checked. In case coalescence occurs, the resulting number is outputted. In case not, then the algorithm is restarted from T(t)=2*T(t) until coalescence occurs.

License GPL-2

LazyLoad yes

Repository CRAN

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NeedsCompilation no

R topics documented:

`binomialcftp-package` *Generates Random Numbers according to the coupling from the past algorithm.*

Description

Dual Markov Chains are generated, one starting at n and the other one at 0 (in this fashion, every possible state is trapped between these two chains) and are updated according to a Metropolis-Hastings step. The transition kernel is defined as a ratio between the density evaluated at the current iteration vs the previous iteration. In this way the chains evolve (in general) in the direction where the density is higher. Coalescence is checked at every step (meaning that both chains coalesce), and in case this happens the resulting random number is outputted at t=0. In case coalescence does not occur, the algorithm is restarted starting from a distant past twice as large as the current starting past time. Every iteration that goes through some t that has previously been traversed, uses the exact same random number used at that point.

Details

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License:	GPL-2
LazyLoad:	yes

Author(s)

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References

James G. Propp and David B. Wilson. Exact sampling with coupled Markov chains and applications to statistical mechanics. Random Structures and Algorithms, 9(1&2):223–252, 1996.

See Also

Perfectly Random Sampling with Markov Chains http://dimacs.rutgers.edu/~dbwilson/exact/

Examples

```
bin_ps(1000,20,0.5)
```

bin_ps *CFTP Binomial Random Numbers*

Description

Main function, return 0-n binomial distributed random numbers according to the coupling from the past algorithm

Usage

```
bin_ps(x, n, p)
```

Arguments

x	sample_size:number of random numbers desired
n	n= binomial parameter
p	p= binomial parameter

Details

As usual,p should be between 0 and 1 and n should be any positive integer

Value

values	Random numbers
iteration_needed	Number of iterations needed until coalescence
rand_used	Number of random numbers used

Note

Running time is different as n and p change

Author(s)

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References

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Examples

```
bin_ps(1000, 20, 0.5)
```

draw_i *generate random integer numbers*

Description

Random +1/-1 numbers. This is a secondary function used by bin_ps

Usage

```
draw_i()
```

Value

+1,-1

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