

NAG Numerical Functions for GPUs Function Document

nag_gpu_depthbb_init

1 Purpose

nag_gpu_depthbb_init initializes the depth-order Brownian bridge generator `nag_gpu_depthbb`. This function must be called before any calls to `nag_gpu_depthbb` and must finally be followed by a call to `nag_gpu_depthbb_cleanup`.

Note: after the first call to **nag_gpu_depthbb_init**, all subsequent calls (for example, to change the time points) must be preceded by a call to `nag_gpu_depthbb_cleanup`.

2 Specification

```
#include <nag_gpu.h>
```

```
void nag_gpu_depthbb_init (float t_start, const float *t, int nTimes,
                          bool bridgeisfree, Nag_Gpu_Comm *comm)
```

3 References

None.

4 Arguments

- 1: **t_start** – float *Input*
On entry: the starting value of the time interval. Usually this will be 0, but it can be either positive or negative.
- 2: **t[nTimes]** – const float * *Input*
On entry: the vector of times at which to compute the Brownian bridge.
Constraint: the values in `t` must be in increasing order, and each must be greater than `t_start`.
- 3: **nTimes** – int *Input*
On entry: the length of the vector `t`.
Constraint: $1 \leq nTimes \leq 4095$.
- 4: **bridgeisfree** – bool *Input*
On entry: if `Nag_TRUE`, `nag_gpu_depthbb` will construct a free Brownian motion via a depth-order Brownian bridge algorithm.
 If `Nag_FALSE`, `nag_gpu_depthbb` will construct a non-free or ‘pinned’ Brownian motion.
- 5: **comm** – Nag_Gpu_Comm * *Communication Data*
`Nag_Gpu_Comm` is a NAG defined type which holds state and communication information and must not be modified in any way.
 This structure is initialized and must be passed to `nag_gpu_depthbb`. Once all required sample paths have been obtained, `comm` must be passed to `nag_gpu_depthbb_cleanup` to free allocated system resources.

5 Error Indicators and Warnings

No argument constraint checking is carried out by this function. You can insert a call to function `nag_gpu_utilCheckMsg` (contained in the header file `nag_gpu.h`) following the call to **nag_gpu_depthbb_init** to check for the last CUDA error message, if any, generated during execution.

6 Example

There is no example program specifically for this function. The example program for `nag_gpu_depthbb` shows how this function should be used.
