PottsSim

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Contents

Chapter 1

Potts simulation model

Running the stable code

To compile the code in terminal use *make* or instead to compile and run, write *make run*. Do not break the directory tree to keep makefiles and scripts fully working.

Folder structure

- *bench* : Keeps some useful benchmarks, more info in the readme inside the folder.
- *build* : Default directory where the binaries are going to be generated
- *include* : Default directory that keeps the "frontend" includes
- *src* : Default directory that keeps the source files.
- *lib* : Default directory that keeps all the .cpp and .h used in a generic source file.
- *tests* : Directory in which is possible to run some regression tests

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 3

Class Index

3.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

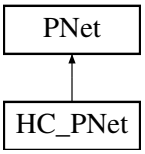
Chapter 4

Class Documentation

4.1 HC_PNet Class Reference

`#include <hc_pnet.h>`

Inheritance diagram for HC_PNet:



Public Member Functions

- **HC_PNet** (const int &N, const int &C, const int &S)
- void **import_connections** (const std::string &filename)
- void **print_cm** ()
- void **save_states_to_file** (const std::string &filename)
- void **save_connections_to_file** (const std::string &filename)
- void **save_J_to_file** (const std::string &filename)
- void **connect_units** (std::default_random_engine &generator)
- void **init_network** (const __fpv &beta, const __fpv &U, const int &p, const __fpv &a, const int *xi)
- void **start_dynamics** (std::default_random_engine &generator, const int &p, const int &tstatus, const int &nupdates, const int *xi, const int &pattern, const __fpv &a, const __fpv &U, const __fpv &w, const __↩ fpv &g, const __fpv &tau, const __fpv &b1, const __fpv &b2, const __fpv &b3, const __fpv &beta, const int &tx)

Private Member Functions

- void **init_states** (const __fpv &beta, const __fpv &U)
- void **update_rule** (const int &unit, const int &pattern, const __fpv &U, const __fpv &w, const __fpv &g, const __fpv &tau, const __fpv &b1, const __fpv &b2, const __fpv &b3, const __fpv &beta, const int &tx, const int &t)
- void **evaluate_m** (const int &p, const __fpv &a, const int *xi, __fpv m[ ])
- void **init_J** (const int &p, const __fpv &a, const int *xi)

Private Attributes

- int C
- int S
- int * cm
- __fpv * J
- __fpv * **active_states**
- __fpv * **inactive_states**
- int * **ucm**
- __fpv * **active_r**
- __fpv * **inactive_r**
- __fpv * **h**
- __fpv * **theta**
- int * **xi**

Additional Inherited Members

4.1.1 Detailed Description

Class defining the High connectivity network

4.1.2 Member Data Documentation

4.1.2.1 int HC_PNet::C [private]

Number of connections per unit

4.1.2.2 int* HC_PNet::cm [private]

Connectivity matrix

4.1.2.3 __fpv* HC_PNet::J [private]

J tensor

4.1.2.4 int HC_PNet::S [private]

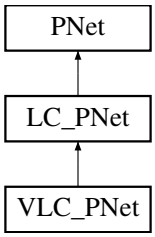
Number of states per unit

The documentation for this class was generated from the following files:

- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/include/hc_pnet.h
- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/lib/hc_pnet.cpp

4.2 LC_PNet Class Reference

Inheritance diagram for LC_PNet:



Public Member Functions

- LC_PNet (const int &N, const int &C, const int &S)
- void **import_connections** (const std::string &filename)
- void **print_cm** ()
- void **save_states_to_file** (const std::string &filename)
- void **save_connections_to_file** (const std::string &filename)
- void **save_J_to_file** (const std::string &filename)
- void **connect_units** (std::default_random_engine &generator)
- void **init_network** (const __fpv &beta, const __fpv &U, const int &p, const __fpv &a, const int *xi)
- void **start_dynamics** (std::default_random_engine &generator, const int &p, const int &tstatus, const int &nupdates, const int *xi, const int &pattern, const __fpv &a, const __fpv &U, const __fpv &w, const __fpv &g, const __fpv &tau, const __fpv &b1, const __fpv &b2, const __fpv &b3, const __fpv &beta, const int &tx)

Protected Member Functions

- void **init_states** (const __fpv &beta, const __fpv &U)
- void **update_rule** (const int &unit, const __fpv buffer[ ], const int &pattern, const __fpv &U, const __fpv &w, const __fpv &g, const __fpv &tau, const __fpv &b1, const __fpv &b2, const __fpv &b3, const __fpv &beta, const int &tx, const int &t)
- void **evaluate_m** (const int &p, const __fpv &a, const int *xi, __fpv m[ ])
- void **init_J** (const int &p, const __fpv &a, const int *xi)

Protected Attributes

- int **C**
- int **S**
- int * **cm**
- __fpv * **J**
- __fpv * **active_states**
- __fpv * **inactive_states**
- int * **ucm**
- __fpv * **active_r**
- __fpv * **inactive_r**
- __fpv * **h**
- __fpv * **theta**
- int * **xi**

Additional Inherited Members

4.2.1 Constructor & Destructor Documentation

4.2.1.1 LC_PNet::LC_PNet (const int & *N*, const int & *C*, const int & *S*)

"£"

The documentation for this class was generated from the following files:

- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/include/lc_pnet.h
- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/lib/lc_pnet.cpp

4.3 parameters Struct Reference

Public Attributes

- int **N**
- int **C**
- int **p**
- int **S**
- int **nupdates**
- int **NumSet**
- int **N_fact**
- int **Num_fact**
- int **tstatus**
- __fpv **a**
- __fpv **U**
- __fpv **b1**
- __fpv **b2**
- __fpv **b3**
- __fpv **beta**
- __fpv **w**
- __fpv **g**
- __fpv **tau**
- __fpv **a_fact**
- __fpv **eps**
- __fpv **a_pf**
- __fpv **fact_eigen_slope**

The documentation for this struct was generated from the following file:

- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/include/parameters_struct.h

4.4 PatternGen Class Reference

Public Member Functions

- **PatternGen** (const int N, const int p, const int S, const __fpv a, const __fpv beta, const int N_fact, const int Num_fact, const __fpv a_fact, const __fpv eps, const __fpv a_pf, const __fpv fact_eigen_slope)
- void **generate** ()
- void **eval_stats** ()
- void **save_pattern_to_file** (const std::string filename)
- int ∗ **get_patt** ()
- int ∗ **get_patt** (const int n)

Private Attributes

- int **N**
- int **p**
- int **S**
- __fpv **a**
- __fpv **beta**
- int **N_fact**
- int **Num_fact**
- __fpv **a_fact**
- __fpv **eps**
- __fpv **a_pf**
- __fpv **fact_eigen_slope**
- int ∗ **Patt**

Friends

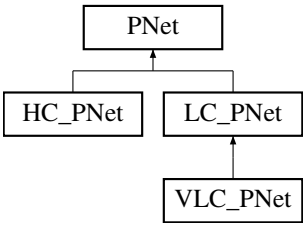
- class **PNetwork**

The documentation for this class was generated from the following files:

- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/include/pattern_gen.h
- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/lib/pattern_gen.cpp

4.5 PNet Class Reference

Inheritance diagram for PNet:



Public Member Functions

- **PNet** (const int &N)
- void **print_ksequence** ()
- virtual void **print_cm** ()=0
- virtual void **save_states_to_file** (const std::string &filename)=0
- virtual void **save_connections_to_file** (const std::string &filename)=0
- virtual void **save_J_to_file** (const std::string &filename)=0
- virtual void **init_network** (const __fpv &beta, const __fpv &U, const int &p, const __fpv &a, const int *xi)=0
- virtual void **start_dynamics** (std::default_random_engine &generator, const int &p, const int &tstatus, const int &nupdates, const int *xi, const int &pattern, const __fpv &a, const __fpv &U, const __fpv &w, const __fpv &g, const __fpv &tau, const __fpv &b1, const __fpv &b2, const __fpv &b3, const __fpv &beta, const int &tx)=0

Public Attributes

- __fpv **latching_length**

Protected Member Functions

- virtual void **evaluate_m** (const int &p, const __fpv &a, const int *xi, __fpv m[ ])=0
- virtual void **init_J** (const int &p, const __fpv &a, const int *xi)=0
- void **get_status** (const int &p, const int &tx, const int &t, const int *xi, const __fpv &a, int &Mumaxold, int &Mumax, int &steps, bool &stop)

Protected Attributes

- int **N**
- std::vector< int > **ksequence**

The documentation for this class was generated from the following files:

- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/lib/pnet.h
- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/lib/pnet.cpp

4.6 PPS Class Reference

Static Public Member Functions

- static void **start** ()

Static Public Attributes

- static int **pid**
- static int **comm_size**
- static std::vector< parameters > **plist**

The documentation for this class was generated from the following files:

- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/include/parallel_scheduler.h
- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/lib/parallel_scheduler.cpp

4.7 RandomSequence Class Reference

Public Member Functions

- **RandomSequence** (const int N)
- void **shuffle** (std::default_random_engine &generator)
- void **print** ()
- int * **begin** ()
- int * **end** ()
- int **get** (const int &i)

Private Attributes

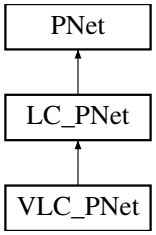
- int * **sequence**
- int **N**

The documentation for this class was generated from the following files:

- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/include/random_seq.h
- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/lib/random_seq.cpp

4.8 VLC_PNet Class Reference

Inheritance diagram for VLC_PNet:



Public Member Functions

- **VLC_PNet** (const int &N, const int &C, const int &S)
- void **start_dynamics** (std::default_random_engine &generator, const int &p, const int &tstatus, const int &nupdates, const int *xi, const int &pattern, const __fpv &a, const __fpv &U, const __fpv &w, const __fpv &g, const __fpv &tau, const __fpv &b1, const __fpv &b2, const __fpv &b3, const __fpv &beta, const int &tx)

Private Member Functions

- void **update_rule** (const int &unit, const int &pattern, const __fpv &U, const __fpv &w, const __fpv &g, const __fpv &tau, const __fpv &b1, const __fpv &b2, const __fpv &b3, const __fpv &beta, const int &tx, const int &t)

Additional Inherited Members

The documentation for this class was generated from the following files:

- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/include/vlc_pnet.h
- /home/deathquasar/Projects/MHPC/Thesis/Code/Potts_code/lib/vlc_pnet.cpp

Index