BNPlib for density estimation:

A nonparametric C++ library (part 2)

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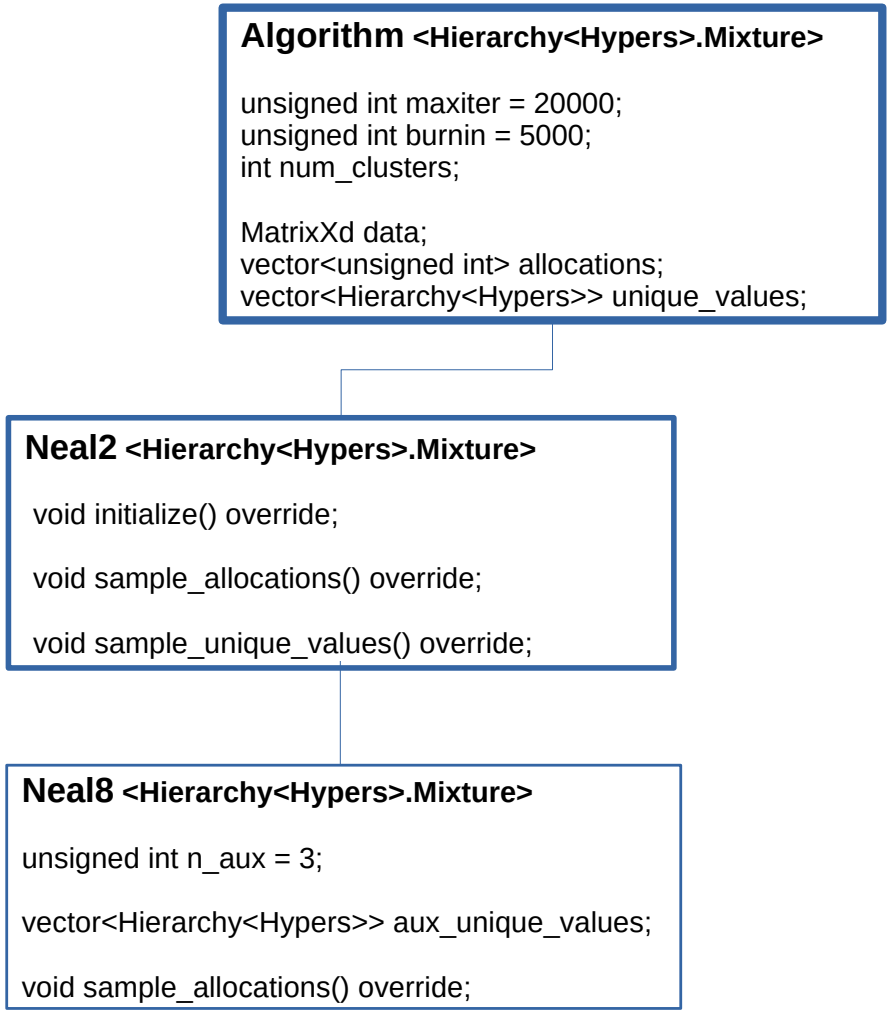
POLITECNICO
MILANO 1863

https://github.com/poliprojects/BNPlib

Algoritmhs


Algorithm <Hierarchy<Hypers>.Mixture>
unsigned int maxiter = 20000;
unsigned int burnin = 5000;
int num_clusters;
MatrixXd data;
vector<unsigned int> allocations;
vector<Hierarchy<Hypers>> unique_values;
Neal2 <Hierarchy<Hypers>.Mixture>
void initialize() override;
void sample_allocations() override;
void sample_unique_values() override;
Neal8 <Hierarchy<Hypers>.Mixture>
unsigned int n_aux = 3;
vector<Hierarchy<Hypers>> aux_unique_values;
void sample_allocations() override;

Hierarchies

HierarchyNNIG <Hypers>

vector<MatrixXd> state;
shared_ptr<Hypers> hypers;

VectorXd eval_marg(MatrixXd datum);
VectorXd like(MatrixXd datum);
void sample_given_data(MatrixXd data);
void draw();
vector<double> normal_gamma_update(VectorXd data,
double mu0, double alpha0, double beta0, double lambda0);

state(2, MatrixXd(1,1))

check in Algorithm Constructor
if data is univariate

HierarchyDummy <Hypers>

vector<MatrixXd> state;
shared_ptr<Hypers> hypers;

VectorXd eval_marg(MatrixXd datum);
VectorXd like(MatrixXd datum);
void sample_given_data(MatrixXd data);
void draw();
std::vector<Eigen::MatrixXd> dummy_update(MatrixXd data,
VectorXd mu0, MatrixXd lambda0);

Hypers

HypersFixedNNIG

double mu0, lambda, alpha0, beta0;

HypersDummy

VectorXd mu0;
MatrixXd lambda0;

Mixtures

DirichletMixture

double totalmass;

double const prob_existing_cluster(int card, unsigned int n)
double const prob_new_cluster(unsigned int n, unsigned int n_unique)

PitYorMixture

double strength;
double discount;

double const prob_existing_cluster(int card, unsigned int n)
double const prob_new_cluster(unsigned int n, unsigned int n_unique)

Algorithms

```
class Factory{
private:
    std::map<std::string, AlgoBuilderType> storage;
public:
    static Factory& Instance();
    void add_builder(const std::string &name, const AlgoBuilde
    auto create_algorithm(const std::string &name) const {}; /
//[...]
```

factories
collectors
input