

FragScanTibo

0.1

Gegenereerd door Doxygen 1.8.18



<b>1 Klasse Index</b>	<b>1</b>
1.1 Klasse Lijst	1
<b>2 Bestand Index</b>	<b>3</b>
2.1 Bestandslijst	3
<b>3 Klassen Documentatie</b>	<b>5</b>
3.1 HMM Struct Referentie	5
3.1.1 Documentatie van data members	5
3.1.1.1 E1_dist	5
3.1.1.2 E_dist	6
3.1.1.3 e_M	6
3.1.1.4 e_M_1	6
3.1.1.5 N	6
3.1.1.6 pi	6
3.1.1.7 S1_dist	6
3.1.1.8 S_dist	6
3.1.1.9 tr	6
3.1.1.10 tr_E	7
3.1.1.11 tr_E_1	7
3.1.1.12 tr_I_I	7
3.1.1.13 tr_M_I	7
3.1.1.14 tr_R_R	7
3.1.1.15 tr_S	7
3.1.1.16 tr_S_1	7
3.2 thread_data Struct Referentie	8
3.2.1 Documentatie van data members	8
3.2.1.1 aa	8
3.2.1.2 cg	8
3.2.1.3 dna	9
3.2.1.4 format	9
3.2.1.5 hmm	9
3.2.1.6 obs_head	9
3.2.1.7 obs_seq	9
3.2.1.8 out	9
3.2.1.9 train	9
3.2.1.10 wholegenome	10
3.3 TRAIN Struct Referentie	10
3.3.1 Documentatie van data members	10
3.3.1.1 E1_dist	10
3.3.1.2 E_dist	10
3.3.1.3 noncoding	10
3.3.1.4 rtrans	11

3.3.1.5 S1_dist . . . . .	11
3.3.1.6 S_dist . . . . .	11
3.3.1.7 start . . . . .	11
3.3.1.8 start1 . . . . .	11
3.3.1.9 stop . . . . .	11
3.3.1.10 stop1 . . . . .	11
3.3.1.11 trans . . . . .	11
<b>4 Bestand Documentatie</b>	<b>13</b>
4.1 FragGeneScan1.31/hmm.h Bestand Referentie . . . . .	13
4.1.1 Documentatie van macro's . . . . .	15
4.1.1.1 A . . . . .	15
4.1.1.2 C . . . . .	16
4.1.1.3 E_STATE . . . . .	16
4.1.1.4 E_STATE_1 . . . . .	16
4.1.1.5 G . . . . .	16
4.1.1.6 I1_STATE . . . . .	16
4.1.1.7 I1_STATE_1 . . . . .	16
4.1.1.8 I2_STATE . . . . .	16
4.1.1.9 I2_STATE_1 . . . . .	16
4.1.1.10 I3_STATE . . . . .	17
4.1.1.11 I3_STATE_1 . . . . .	17
4.1.1.12 I4_STATE . . . . .	17
4.1.1.13 I4_STATE_1 . . . . .	17
4.1.1.14 I5_STATE . . . . .	17
4.1.1.15 I5_STATE_1 . . . . .	17
4.1.1.16 I6_STATE . . . . .	17
4.1.1.17 I6_STATE_1 . . . . .	17
4.1.1.18 M1_STATE . . . . .	18
4.1.1.19 M1_STATE_1 . . . . .	18
4.1.1.20 M2_STATE . . . . .	18
4.1.1.21 M2_STATE_1 . . . . .	18
4.1.1.22 M3_STATE . . . . .	18
4.1.1.23 M3_STATE_1 . . . . .	18
4.1.1.24 M4_STATE . . . . .	18
4.1.1.25 M4_STATE_1 . . . . .	18
4.1.1.26 M5_STATE . . . . .	19
4.1.1.27 M5_STATE_1 . . . . .	19
4.1.1.28 M6_STATE . . . . .	19
4.1.1.29 M6_STATE_1 . . . . .	19
4.1.1.30 NOSTATE . . . . .	19
4.1.1.31 NUM_STATE . . . . .	19

4.1.1.32 R_STATE . . . . .	19
4.1.1.33 S_STATE . . . . .	19
4.1.1.34 S_STATE_1 . . . . .	20
4.1.1.35 T . . . . .	20
4.1.1.36 TR_DD . . . . .	20
4.1.1.37 TR_DM . . . . .	20
4.1.1.38 TR_ER . . . . .	20
4.1.1.39 TR_ES . . . . .	20
4.1.1.40 TR_ES1 . . . . .	20
4.1.1.41 TR_GE . . . . .	20
4.1.1.42 TR_GG . . . . .	21
4.1.1.43 TR_II . . . . .	21
4.1.1.44 TR_IM . . . . .	21
4.1.1.45 TR_MD . . . . .	21
4.1.1.46 TR_MI . . . . .	21
4.1.1.47 TR_MM . . . . .	21
4.1.1.48 TR_RR . . . . .	21
4.1.1.49 TR_RS . . . . .	21
4.1.2 Documentatie van functies . . . . .	22
4.1.2.1 free_hmm() . . . . .	22
4.1.2.2 get_corrected_dna() . . . . .	22
4.1.2.3 get_prob_from_cg() . . . . .	22
4.1.2.4 get_protein() . . . . .	23
4.1.2.5 get_rc_dna() . . . . .	23
4.1.2.6 get_train_from_file() . . . . .	24
4.1.2.7 viterbi() . . . . .	24
4.2 FragGeneScan1.31/hmm_lib.c Bestand Referentie . . . . .	26
4.2.1 Documentatie van functies . . . . .	26
4.2.1.1 dump_memory() . . . . .	26
4.2.1.2 free_hmm() . . . . .	27
4.2.1.3 get_prob_from_cg() . . . . .	27
4.2.1.4 get_train_from_file() . . . . .	27
4.2.1.5 viterbi() . . . . .	28
4.3 FragGeneScan1.31/run_hmm.c Bestand Referentie . . . . .	30
4.3.1 Documentatie van macro's . . . . .	30
4.3.1.1 ADD_LEN . . . . .	30
4.3.1.2 STRINGLEN . . . . .	31
4.3.2 Documentatie van functies . . . . .	31
4.3.2.1 appendSeq() . . . . .	31
4.3.2.2 main() . . . . .	31
4.3.2.3 print_error() . . . . .	32
4.3.2.4 print_file_error() . . . . .	32

4.3.2.5 thread_func()	33
4.4 FragGeneScan1.31/run_hmm.h Bestand Referentie	34
4.4.1 Documentatie van typedefs	35
4.4.1.1 thread_data	35
4.4.2 Documentatie van functies	35
4.4.2.1 print_error()	35
4.4.2.2 print_file_error()	36
4.4.2.3 thread_func()	37
4.5 FragGeneScan1.31/util_lib.c Bestand Referentie	37
4.5.1 Documentatie van functies	38
4.5.1.1 dmatrix()	38
4.5.1.2 dvector()	39
4.5.1.3 free_dmatrix()	39
4.5.1.4 free_dvector()	39
4.5.1.5 free_imatrix()	40
4.5.1.6 free_ivector()	40
4.5.1.7 get_protein()	40
4.5.1.8 get_rc_dna()	41
4.5.1.9 get_rc_dna_indel()	41
4.5.1.10 imatrix()	42
4.5.1.11 ivector()	42
4.5.1.12 nt2int()	43
4.5.1.13 nt2int_rc()	43
4.5.1.14 nt2int_rc_indel()	44
4.5.1.15 print_usage()	44
4.5.1.16 tr2int()	44
4.5.1.17 trinucleotide()	45
4.5.1.18 trinucleotide_pep()	45
4.6 FragGeneScan1.31/util_lib.h Bestand Referentie	45
4.6.1 Documentatie van functies	47
4.6.1.1 dmatrix()	47
4.6.1.2 dvector()	47
4.6.1.3 free_dmatrix()	47
4.6.1.4 free_dvector()	48
4.6.1.5 free_imatrix()	48
4.6.1.6 free_ivector()	48
4.6.1.7 get_protein()	49
4.6.1.8 imatrix()	49
4.6.1.9 ivector()	49
4.6.1.10 nt2int()	50
4.6.1.11 nt2int_rc()	50
4.6.1.12 print_usage()	51

---

4.6.1.13 tr2int()	51
4.6.1.14 trinucleotide()	51





# Hoofdstuk 1

## Klasse Index

### 1.1 Klasse Lijst

Hieronder volgen de klassen, structs en unions met voor elk een korte beschrijving:

HMM	5
thread_data	8
TRAIN	10



## Hoofdstuk 2

# Bestand Index

### 2.1 Bestandslijst

Hieronder volgt de lijst met alle bestanden, elk met een korte beschrijving:

src/hmm.h . . . . .	13
src/hmm_lib.c . . . . .	26
src/run_hmm.c . . . . .	30
src/run_hmm.h . . . . .	34
src/util_lib.c . . . . .	37
src/util_lib.h . . . . .	45



## Hoofdstuk 3

# Klassen Documentatie

### 3.1 HMM Struct Referentie

```
#include <hmm.h>
```

#### Public Attributen

- double [pi](#) [29]
- int [N](#)
- double [tr](#) [14]
- double [e\\_M\\_1](#) [6][16][4]
- double [e\\_M](#) [6][16][4]
- double [tr\\_R\\_R](#) [4][4]
- double [tr\\_I\\_I](#) [4][4]
- double [tr\\_M\\_I](#) [4][4]
- double [tr\\_S](#) [61][64]
- double [tr\\_E](#) [61][64]
- double [tr\\_S\\_1](#) [61][64]
- double [tr\\_E\\_1](#) [61][64]
- double [S\\_dist](#) [6]
- double [E\\_dist](#) [6]
- double [S1\\_dist](#) [6]
- double [E1\\_dist](#) [6]

#### 3.1.1 Documentatie van data members

##### 3.1.1.1 E1\_dist

```
double E1_dist[6]
```

**3.1.1.2 E\_dist**

```
double E_dist[6]
```

**3.1.1.3 e\_M**

```
double e_M[6][16][4]
```

**3.1.1.4 e\_M\_1**

```
double e_M_1[6][16][4]
```

**3.1.1.5 N**

```
int N
```

**3.1.1.6 pi**

```
double pi[29]
```

**3.1.1.7 S1\_dist**

```
double S1_dist[6]
```

**3.1.1.8 S\_dist**

```
double S_dist[6]
```

**3.1.1.9 tr**

```
double tr[14]
```

**3.1.1.10 tr\_E**

```
double tr_E[61][64]
```

**3.1.1.11 tr\_E\_1**

```
double tr_E_1[61][64]
```

**3.1.1.12 tr\_I\_I**

```
double tr_I_I[4][4]
```

**3.1.1.13 tr\_M\_I**

```
double tr_M_I[4][4]
```

**3.1.1.14 tr\_R\_R**

```
double tr_R_R[4][4]
```

**3.1.1.15 tr\_S**

```
double tr_S[61][64]
```

**3.1.1.16 tr\_S\_1**

```
double tr_S_1[61][64]
```

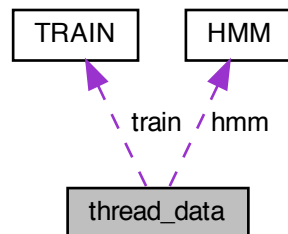
De documentatie voor deze struct is gegenereerd op grond van het volgende bestand:

- [src/hmm.h](#)

## 3.2 thread\_data Struct Referentie

```
#include <run_hmm.h>
```

Collaboratie diagram voor thread\_data:



### Public Attributen

- FILE \* [out](#)
- FILE \* [aa](#)
- FILE \* [dna](#)
- char \* [obs\\_head](#)
- char \* [obs\\_seq](#)
- int [wholegenome](#)
- int [cg](#)
- int [format](#)
- HMM \* [hmm](#)
- TRAIN \* [train](#)

### 3.2.1 Documentatie van data members

#### 3.2.1.1 aa

```
FILE* aa
```

#### 3.2.1.2 cg

```
int cg
```



### 3.2.1.3 dna

FILE\* dna

### 3.2.1.4 format

int format

### 3.2.1.5 hmm

HMM\* hmm

### 3.2.1.6 obs\_head

char\* obs\_head

### 3.2.1.7 obs\_seq

char\* obs\_seq

### 3.2.1.8 out

FILE\* out

### 3.2.1.9 train

TRAIN\* train

### 3.2.1.10 wholegenome

```
int wholegenome
```

De documentatie voor deze struct is gegenereerd op grond van het volgende bestand:

- [src/run\\_hmm.h](#)

## 3.3 TRAIN Struct Referentie

```
#include <hmm.h>
```

### Public Attributen

- double [trans](#) [44][6][16][4]
- double [rtrans](#) [44][6][16][4]
- double [noncoding](#) [44][4][4]
- double [start](#) [44][61][64]
- double [stop](#) [44][61][64]
- double [start1](#) [44][61][64]
- double [stop1](#) [44][61][64]
- double [S\\_dist](#) [44][6]
- double [E\\_dist](#) [44][6]
- double [S1\\_dist](#) [44][6]
- double [E1\\_dist](#) [44][6]

### 3.3.1 Documentatie van data members

#### 3.3.1.1 E1\_dist

```
double E1_dist[44][6]
```

#### 3.3.1.2 E\_dist

```
double E_dist[44][6]
```

#### 3.3.1.3 noncoding

```
double noncoding[44][4][4]
```

#### 3.3.1.4 rtrans

```
double rtrans[44][6][16][4]
```

#### 3.3.1.5 S1\_dist

```
double S1_dist[44][6]
```

#### 3.3.1.6 S\_dist

```
double S_dist[44][6]
```

#### 3.3.1.7 start

```
double start[44][61][64]
```

#### 3.3.1.8 start1

```
double start1[44][61][64]
```

#### 3.3.1.9 stop

```
double stop[44][61][64]
```

#### 3.3.1.10 stop1

```
double stop1[44][61][64]
```

#### 3.3.1.11 trans

```
double trans[44][6][16][4]
```

De documentatie voor deze struct is gegenereerd op grond van het volgende bestand:

- [src/hmm.h](#)



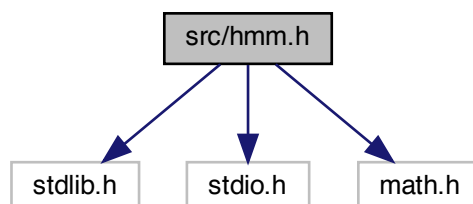
## Hoofdstuk 4

# Bestand Documentatie

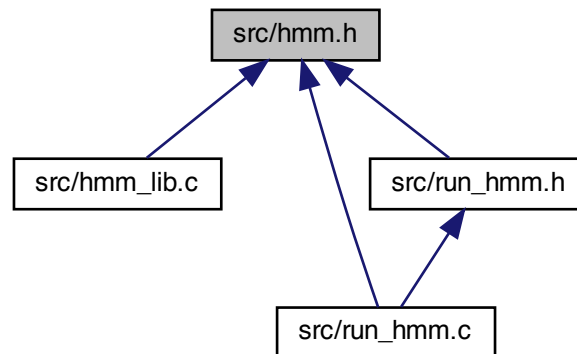
### 4.1 src/hmm.h Bestand Referentie

```
#include <stdlib.h>  
#include <stdio.h>  
#include <math.h>
```

Include afhankelijkheidsgraaf voor hmm.h:



Deze graaf geeft aan welke bestanden direct of indirect afhankelijk zijn van dit bestand:



## Klassen

- struct [HMM](#)
- struct [TRAIN](#)

## Macros

- #define [A](#) 0
- #define [C](#) 1
- #define [G](#) 2
- #define [T](#) 3
- #define [NUM\\_STATE](#) 29
- #define [NOSTATE](#) -1
- #define [S\\_STATE](#) 0
- #define [E\\_STATE](#) 1
- #define [R\\_STATE](#) 2
- #define [S\\_STATE\\_1](#) 3
- #define [E\\_STATE\\_1](#) 4
- #define [M1\\_STATE](#) 5
- #define [M2\\_STATE](#) 6
- #define [M3\\_STATE](#) 7
- #define [M4\\_STATE](#) 8
- #define [M5\\_STATE](#) 9
- #define [M6\\_STATE](#) 10
- #define [M1\\_STATE\\_1](#) 11
- #define [M2\\_STATE\\_1](#) 12
- #define [M3\\_STATE\\_1](#) 13
- #define [M4\\_STATE\\_1](#) 14
- #define [M5\\_STATE\\_1](#) 15
- #define [M6\\_STATE\\_1](#) 16
- #define [I1\\_STATE](#) 17
- #define [I2\\_STATE](#) 18

- `#define I3_STATE` 19
- `#define I4_STATE` 20
- `#define I5_STATE` 21
- `#define I6_STATE` 22
- `#define I1_STATE_1` 23
- `#define I2_STATE_1` 24
- `#define I3_STATE_1` 25
- `#define I4_STATE_1` 26
- `#define I5_STATE_1` 27
- `#define I6_STATE_1` 28
- `#define TR_MM` 0
- `#define TR_MI` 1
- `#define TR_MD` 2
- `#define TR_II` 3
- `#define TR_IM` 4
- `#define TR_DD` 5
- `#define TR_DM` 6
- `#define TR_GE` 7
- `#define TR_GG` 8
- `#define TR_ER` 9
- `#define TR_RS` 10
- `#define TR_RR` 11
- `#define TR_ES` 12
- `#define TR_ES1` 13

## Functies

- `int get_prob_from_cg` (`HMM` \*hmm, `TRAIN` \*train, char \*O)
- `void get_train_from_file` (char \*filename, `HMM` \*hmm\_ptr, char \*mfilename, char \*mfilename1, char \*nfilename, char \*sfilename, char \*pfilename, char \*s1filename, char \*p1filename, char \*dfilename, `TRAIN` \*train\_ptr)
- `void viterbi` (`HMM` \*hmm\_ptr, `TRAIN` \*train\_ptr, char \*O, FILE \*out\_filename, FILE \*log\_filename, FILE \*dna\_filename, char \*head, int metagene, int cg, int format)
- `void free_hmm` (`HMM` \*hmm)
- `void get_protein` (char \*dna, char \*protein, int strand, int whole\_genome)
- `void get_rc_dna` (char \*dna, char \*dna1)
- `void get_corrected_dna` (char \*dna, char \*dna\_f)

### 4.1.1 Documentatie van macro's

#### 4.1.1.1 A

```
#define A 0
```

**4.1.1.2 C**

```
#define C 1
```

**4.1.1.3 E\_STATE**

```
#define E_STATE 1
```

**4.1.1.4 E\_STATE\_1**

```
#define E_STATE_1 4
```

**4.1.1.5 G**

```
#define G 2
```

**4.1.1.6 I1\_STATE**

```
#define I1_STATE 17
```

**4.1.1.7 I1\_STATE\_1**

```
#define I1_STATE_1 23
```

**4.1.1.8 I2\_STATE**

```
#define I2_STATE 18
```

**4.1.1.9 I2\_STATE\_1**

```
#define I2_STATE_1 24
```



**4.1.1.10 I3\_STATE**

```
#define I3_STATE 19
```

**4.1.1.11 I3\_STATE\_1**

```
#define I3_STATE_1 25
```

**4.1.1.12 I4\_STATE**

```
#define I4_STATE 20
```

**4.1.1.13 I4\_STATE\_1**

```
#define I4_STATE_1 26
```

**4.1.1.14 I5\_STATE**

```
#define I5_STATE 21
```

**4.1.1.15 I5\_STATE\_1**

```
#define I5_STATE_1 27
```

**4.1.1.16 I6\_STATE**

```
#define I6_STATE 22
```

**4.1.1.17 I6\_STATE\_1**

```
#define I6_STATE_1 28
```

**4.1.1.18 M1\_STATE**

```
#define M1_STATE 5
```

**4.1.1.19 M1\_STATE\_1**

```
#define M1_STATE_1 11
```

**4.1.1.20 M2\_STATE**

```
#define M2_STATE 6
```

**4.1.1.21 M2\_STATE\_1**

```
#define M2_STATE_1 12
```

**4.1.1.22 M3\_STATE**

```
#define M3_STATE 7
```

**4.1.1.23 M3\_STATE\_1**

```
#define M3_STATE_1 13
```

**4.1.1.24 M4\_STATE**

```
#define M4_STATE 8
```

**4.1.1.25 M4\_STATE\_1**

```
#define M4_STATE_1 14
```

**4.1.1.26 M5\_STATE**

```
#define M5_STATE 9
```

**4.1.1.27 M5\_STATE\_1**

```
#define M5_STATE_1 15
```

**4.1.1.28 M6\_STATE**

```
#define M6_STATE 10
```

**4.1.1.29 M6\_STATE\_1**

```
#define M6_STATE_1 16
```

**4.1.1.30 NOSTATE**

```
#define NOSTATE -1
```

**4.1.1.31 NUM\_STATE**

```
#define NUM_STATE 29
```

**4.1.1.32 R\_STATE**

```
#define R_STATE 2
```

**4.1.1.33 S\_STATE**

```
#define S_STATE 0
```

**4.1.1.34 S\_STATE\_1**

```
#define S_STATE_1 3
```

**4.1.1.35 T**

```
#define T 3
```

**4.1.1.36 TR\_DD**

```
#define TR_DD 5
```

**4.1.1.37 TR\_DM**

```
#define TR_DM 6
```

**4.1.1.38 TR\_ER**

```
#define TR_ER 9
```

**4.1.1.39 TR\_ES**

```
#define TR_ES 12
```

**4.1.1.40 TR\_ES1**

```
#define TR_ES1 13
```

**4.1.1.41 TR\_GE**

```
#define TR_GE 7
```

**4.1.1.42 TR\_GG**

```
#define TR_GG 8
```

**4.1.1.43 TR\_II**

```
#define TR_II 3
```

**4.1.1.44 TR\_IM**

```
#define TR_IM 4
```

**4.1.1.45 TR\_MD**

```
#define TR_MD 2
```

**4.1.1.46 TR\_MI**

```
#define TR_MI 1
```

**4.1.1.47 TR\_MM**

```
#define TR_MM 0
```

**4.1.1.48 TR\_RR**

```
#define TR_RR 11
```

**4.1.1.49 TR\_RS**

```
#define TR_RS 10
```

## 4.1.2 Documentatie van functies

### 4.1.2.1 free\_hmm()

```
void free_hmm (
    HMM * hmm )
```

Hier is de call graaf voor deze functie:



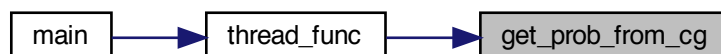
### 4.1.2.2 get\_corrected\_dna()

```
void get_corrected_dna (
    char * dna,
    char * dna_f )
```

### 4.1.2.3 get\_prob\_from\_cg()

```
int get_prob_from_cg (
    HMM * hmm,
    TRAIN * train,
    char * O )
```

Hier is de caller graaf voor deze functie:



#### 4.1.2.4 get\_protein()

```
void get_protein (
    char * dna,
    char * protein,
    int strand,
    int whole_genome )
```

Hier is de caller graaf voor deze functie:



#### 4.1.2.5 get\_rc\_dna()

```
void get_rc_dna (
    char * dna,
    char * dna1 )
```

Hier is de call graaf voor deze functie:



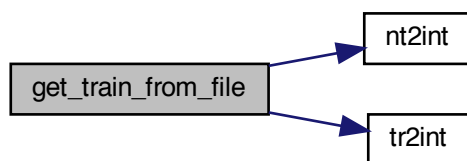
Hier is de caller graaf voor deze functie:



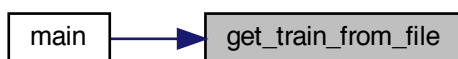
#### 4.1.2.6 get\_train\_from\_file()

```
void get_train_from_file (
    char * filename,
    HMM * hmm_ptr,
    char * mfilename,
    char * mfilename1,
    char * nfilename,
    char * sfilename,
    char * pfilename,
    char * slfilename,
    char * plfilename,
    char * dfilename,
    TRAIN * train_ptr )
```

Hier is de call graaf voor deze functie:



Hier is de caller graaf voor deze functie:



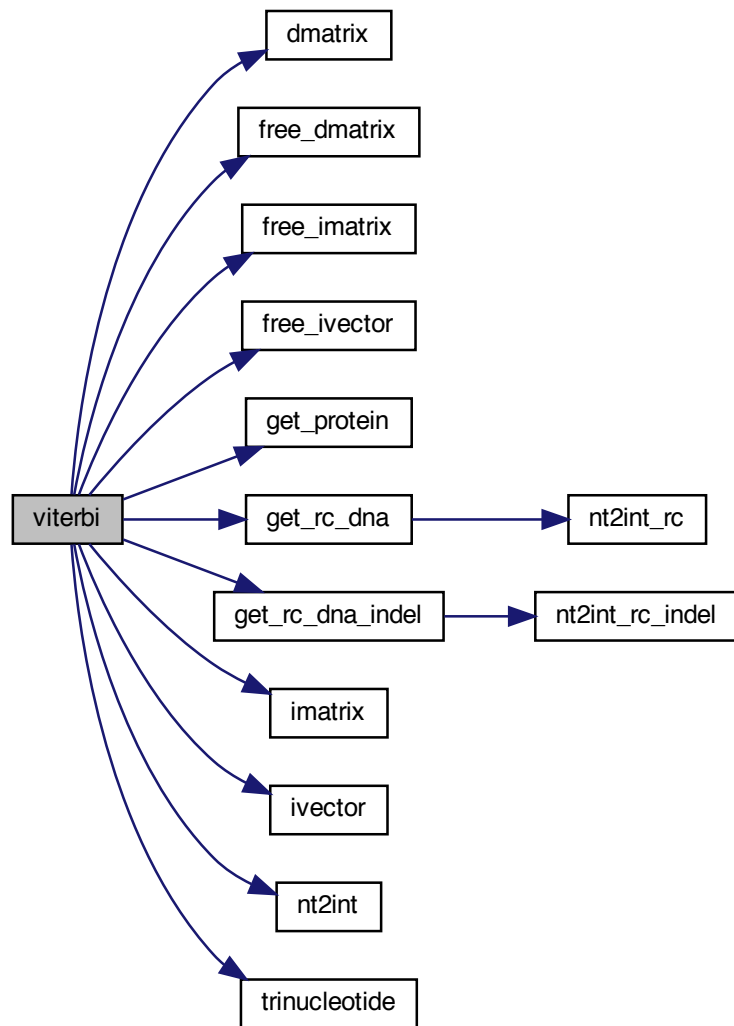
#### 4.1.2.7 viterbi()

```
void viterbi (
    HMM * hmm_ptr,
    TRAIN * train_ptr,
    char * O,
    FILE * out_filename,
    FILE * log_filename,
    FILE * dna_filename,
```

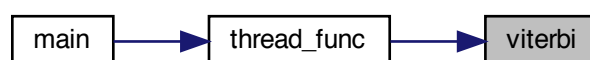


```
char * head,  
int metagene,  
int cg,  
int format )
```

Hier is de call graaf voor deze functie:



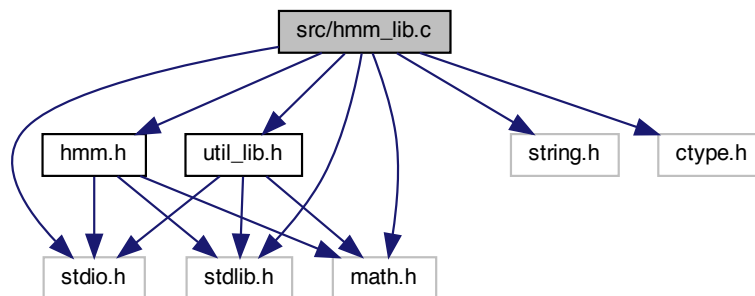
Hier is de caller graaf voor deze functie:



## 4.2 src/hmm\_lib.c Bestand Referentie

```
#include <stdio.h>
#include <math.h>
#include <string.h>
#include <stdlib.h>
#include <ctype.h>
#include "hmm.h"
#include "util_lib.h"
```

Include afhankelijkheidsgraaf voor hmm\_lib.c:



## Functies

- void [dump\\_memory](#) (void \*p, int size)
- void [viterbi](#) (HMM \*hmm\_ptr, [TRAIN](#) \*train\_ptr, char \*O, FILE \*fp\_out, FILE \*fp\_aa, FILE \*fp\_dna, char \*head, int whole\_genome, int cg, int format)
- int [get\\_prob\\_from\\_cg](#) (HMM \*hmm\_ptr, [TRAIN](#) \*train\_ptr, char \*O)
- void [get\\_train\\_from\\_file](#) (char \*filename, HMM \*hmm\_ptr, char \*mfilename, char \*mfilename1, char \*nfilename, char \*sfilename, char \*pfilename, char \*s1filename, char \*dfilename, [TRAIN](#) \*train\_ptr)
- void [free\\_hmm](#) (HMM \*hmm\_ptr)

### 4.2.1 Documentatie van functies

#### 4.2.1.1 dump\_memory()

```
void dump_memory (
    void * p,
    int size )
```

#### 4.2.1.2 free\_hmm()

```
void free_hmm (
    HMM * hmm_ptr )
```

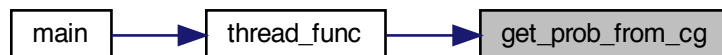
Hier is de call graaf voor deze functie:



#### 4.2.1.3 get\_prob\_from\_cg()

```
int get_prob_from_cg (
    HMM * hmm_ptr,
    TRAIN * train_ptr,
    char * O )
```

Hier is de caller graaf voor deze functie:

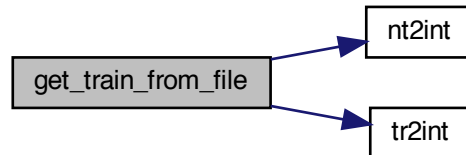


#### 4.2.1.4 get\_train\_from\_file()

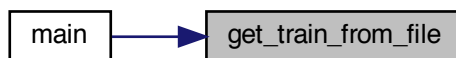
```
void get_train_from_file (
    char * filename,
    HMM * hmm_ptr,
    char * mfilename,
    char * mfilename1,
    char * nfilename,
    char * sfilename,
    char * pfilename,
    char * slfilename,
    char * plfilename,
```

```
char * dfilename,  
TRAIN * train_ptr )
```

Hier is de call graaf voor deze functie:



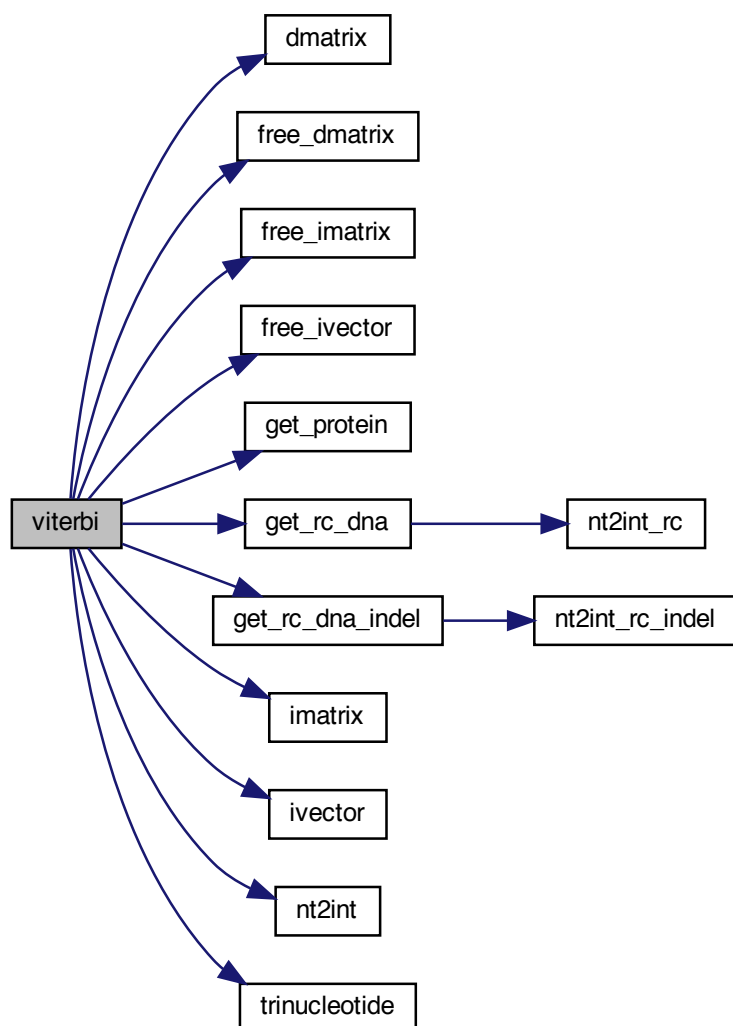
Hier is de caller graaf voor deze functie:



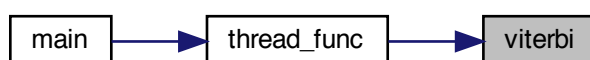
#### 4.2.1.5 viterbi()

```
void viterbi (  
    HMM * hmm_ptr,  
    TRAIN * train_ptr,  
    char * O,  
    FILE * fp_out,  
    FILE * fp_aa,  
    FILE * fp_dna,  
    char * head,  
    int whole_genome,  
    int cg,  
    int format )
```

Hier is de call graaf voor deze functie:



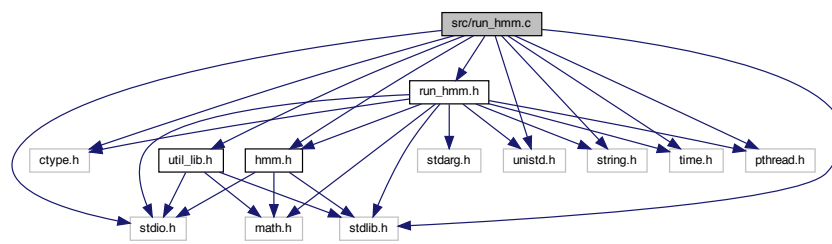
Hier is de caller graaf voor deze functie:



## 4.3 src/run\_hmm.c Bestand Referentie

```
#include <ctype.h>
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <string.h>
#include <time.h>
#include "hmm.h"
#include "run_hmm.h"
#include "util_lib.h"
#include <pthread.h>
```

Include afhankelijkheidsgraaf voor run\_hmm.c:



### Macros

- #define `ADD_LEN` 1024
- #define `STRINGLEN` 4096

### Functies

- int `main` (int argc, char \*\*argv)
- void \* `thread_func` (void \*threadarr)
- int `appendSeq` (char \*input, char \*\*seq, int input\_max)
- void `print_error` (const char \*error\_message,...)
- void `print_file_error` (const char \*error\_message, char \*file)

### 4.3.1 Documentatie van macro's

#### 4.3.1.1 ADD\_LEN

```
#define ADD_LEN 1024
```

#### 4.3.1.2 STRINGLEN

```
#define STRINGLEN 4096
```

### 4.3.2 Documentatie van functies

#### 4.3.2.1 appendSeq()

```
int appendSeq (
    char * input,
    char ** seq,
    int input_max )
```

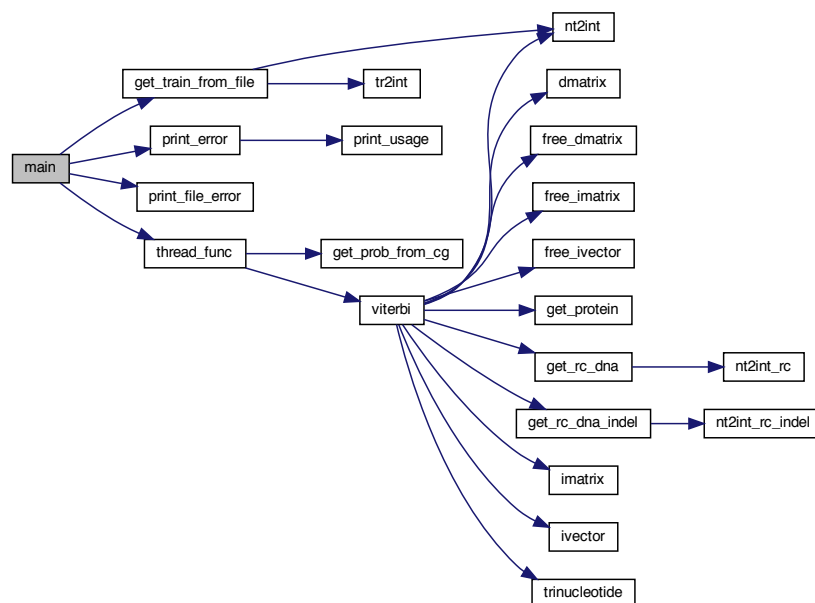
#### 4.3.2.2 main()

```
int main (
    int argc,
    char ** argv )
```

Entry point of program

1. Initialization of variables and datatypes
2. Check File acessibility

Hier is de call graaf voor deze functie:



#### 4.3.2.3 print\_error()

```
void print_error (
    const char * error_message,
    ... )
```

Error function:

1. Print error message
2. Call [print\\_usage\(\)](#) from util\_lib
3. EXIT program

Hier is de call graaf voor deze functie:



Hier is de caller graaf voor deze functie:



#### 4.3.2.4 print\_file\_error()

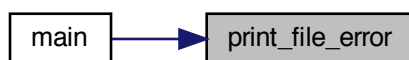
```
void print_file_error (
    const char * error_message,
    char * file )
```

Error function:

1. Print error message
2. EXIT program



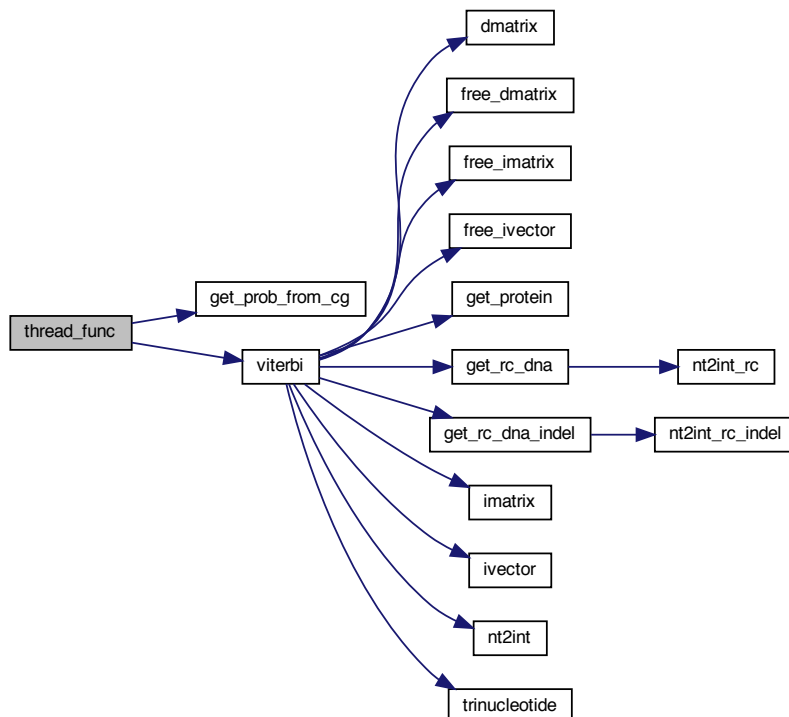
Hier is de caller graaf voor deze functie:



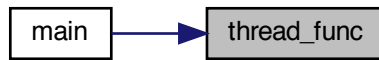
#### 4.3.2.5 thread\_func()

```
void* thread_func (  
    void * threadarr )
```

Hier is de call graaf voor deze functie:



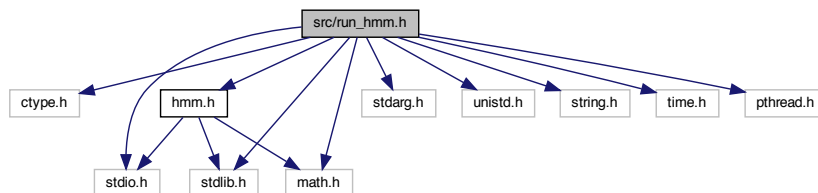
Hier is de caller graaf voor deze functie:



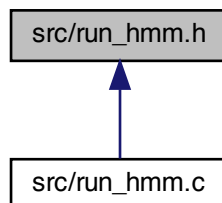
#### 4.4 src/run\_hmm.h Bestand Referentie

```
#include <ctype.h>
#include <stdio.h>
#include <stdlib.h>
#include <stdarg.h>
#include <math.h>
#include <unistd.h>
#include <string.h>
#include <time.h>
#include "hmm.h"
#include <pthread.h>
```

Include afhankelijkheidsgraaf voor run\_hmm.h:



Deze graaf geeft aan welke bestanden direct of indirect afhankelijk zijn van dit bestand:



## Klassen

- struct [thread\\_data](#)

## Typedefs

- typedef struct [thread\\_data](#) [thread\\_data](#)

## Funcities

- void \* [thread\\_func](#) (void \*threadarr)
- void [print\\_error](#) (const char \*error\_message,...)
- void [print\\_file\\_error](#) (const char \*error\_message, char \*file)

### 4.4.1 Documentatie van typedefs

#### 4.4.1.1 thread\_data

```
typedef struct thread\_data thread\_data
```

### 4.4.2 Documentatie van functies

#### 4.4.2.1 print\_error()

```
void print_error (  
    const char * error_message,  
    ... )
```

Error function:

1. Print error message
2. Call [print\\_usage\(\)](#) from util\_lib
3. EXIT program

Hier is de call graaf voor deze functie:



Hier is de caller graaf voor deze functie:



#### 4.4.2.2 `print_file_error()`

```
void print_file_error (
    const char * error_message,
    char * file )
```

Error function:

1. Print error message
2. EXIT program

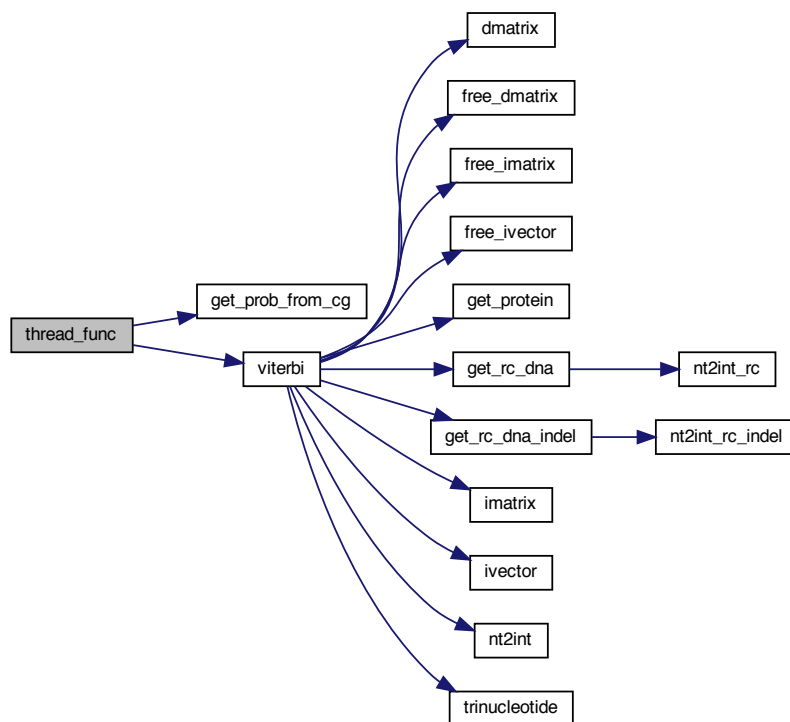
Hier is de caller graaf voor deze functie:



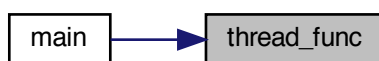
#### 4.4.2.3 thread\_func()

```
void* thread_func (  
    void * threadarr )
```

Hier is de call graaf voor deze functie:



Hier is de caller graaf voor deze functie:

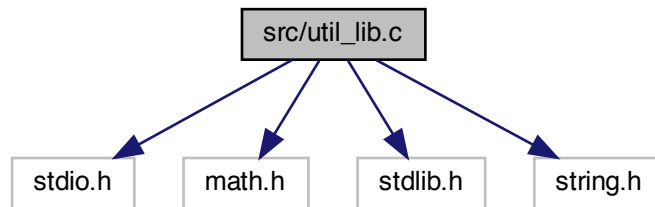


## 4.5 src/util\_lib.c Bestand Referentie

```
#include <stdio.h>  
#include <math.h>  
#include <stdlib.h>
```

```
#include <string.h>
```

Include afhankelijkheidsgraaf voor util\_lib.c:



## Funcities

- double \*\* [dmatrix](#) (int num\_row, int num\_col)
- int \*\* [imatrix](#) (int num\_row, int num\_col)
- double \* [dvector](#) (int nh)
- int \* [ivector](#) (int nh)
- void [free\\_dvector](#) (double \*v)
- void [free\\_ivector](#) (int \*v)
- void [free\\_dmatrix](#) (double \*\*m, int num\_row)
- void [free\\_imatrix](#) (int \*\*m, int num\_row)
- int [tr2int](#) (char \*tr)
- int [nt2int](#) (char nt)
- int [nt2int\\_rc](#) (char nt)
- int [nt2int\\_rc\\_indel](#) (char nt)
- int [trinucleotide](#) (char a, char b, char c)
- int [trinucleotide\\_pep](#) (char a, char b, char c)
- void [get\\_rc\\_dna](#) (char \*dna, char \*dna1)
- void [get\\_rc\\_dna\\_indel](#) (char \*dna, char \*dna1)
- void [get\\_protein](#) (char \*dna, char \*protein, int strand, int whole\_genome)
- void [print\\_usage](#) ()

### 4.5.1 Documentatie van functies

#### 4.5.1.1 [dmatrix\(\)](#)

```
double** dmatrix (  
    int num_row,  
    int num_col )
```

Hier is de caller graaf voor deze functie:



#### 4.5.1.2 dvector()

```
double* dvector (
    int nh )
```

#### 4.5.1.3 free\_dmatrix()

```
void free_dmatrix (
    double ** m,
    int num_row )
```

Hier is de caller graaf voor deze functie:



#### 4.5.1.4 free\_dvector()

```
void free_dvector (
    double * v )
```

Hier is de caller graaf voor deze functie:



#### 4.5.1.5 free\_imatrix()

```
void free_imatrix (
    int ** m,
    int num_row )
```

Hier is de caller graaf voor deze functie:



#### 4.5.1.6 free\_ivector()

```
void free_ivector (
    int * v )
```

Hier is de caller graaf voor deze functie:



#### 4.5.1.7 get\_protein()

```
void get_protein (
    char * dna,
    char * protein,
    int strand,
    int whole_genome )
```

Hier is de call graaf voor deze functie:





Hier is de caller graaf voor deze functie:



#### 4.5.1.8 get\_rc\_dna()

```
void get_rc_dna (
    char * dna,
    char * dna1 )
```

Hier is de call graaf voor deze functie:



Hier is de caller graaf voor deze functie:



#### 4.5.1.9 get\_rc\_dna\_indel()

```
void get_rc_dna_indel (
    char * dna,
    char * dna1 )
```

Hier is de call graaf voor deze functie:



Hier is de caller graaf voor deze functie:



#### 4.5.1.10 imatrix()

```
int** imatrix (  
    int num_row,  
    int num_col )
```

Hier is de caller graaf voor deze functie:



#### 4.5.1.11 ivector()

```
int* ivector (  
    int nh )
```

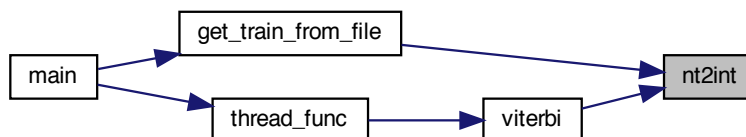
Hier is de caller graaf voor deze functie:



#### 4.5.1.12 nt2int()

```
int nt2int (  
    char nt )
```

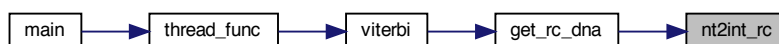
Hier is de caller graaf voor deze functie:



#### 4.5.1.13 nt2int\_rc()

```
int nt2int_rc (  
    char nt )
```

Hier is de caller graaf voor deze functie:



#### 4.5.1.14 nt2int\_rc\_indel()

```
int nt2int_rc_indel (  
    char nt )
```

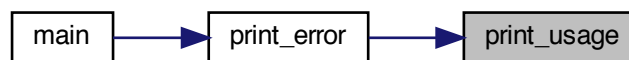
Hier is de caller graaf voor deze functie:



#### 4.5.1.15 print\_usage()

```
void print_usage ( )
```

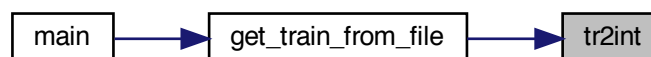
Hier is de caller graaf voor deze functie:



#### 4.5.1.16 tr2int()

```
int tr2int (  
    char * tr )
```

Hier is de caller graaf voor deze functie:



#### 4.5.1.17 trinucleotide()

```
int trinucleotide (  
    char a,  
    char b,  
    char c )
```

Hier is de caller graaf voor deze functie:



#### 4.5.1.18 trinucleotide\_pep()

```
int trinucleotide_pep (  
    char a,  
    char b,  
    char c )
```

Hier is de caller graaf voor deze functie:

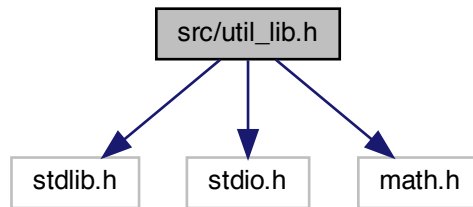


## 4.6 src/util\_lib.h Bestand Referentie

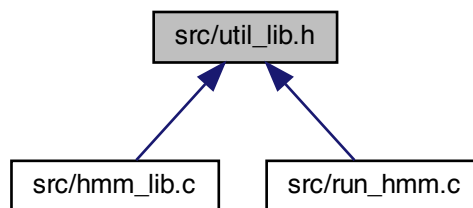
```
#include <stdlib.h>  
#include <stdio.h>
```

```
#include <math.h>
```

Include afhankelijkheidsgraaf voor util\_lib.h:



Deze graaf geeft aan welke bestanden direct of indirect afhankelijk zijn van dit bestand:



## Funcities

- double \*\* [dmatrix](#) (int num\_row, int num\_col)
- double \* [dvector](#) (int nh)
- int \*\* [imatrix](#) (int num\_row, int num\_col)
- int \* [ivector](#) (int nh)
- void [free\\_dvector](#) (double \*v)
- void [free\\_dmatrix](#) (double \*\*m, int num\_row)
- void [free\\_ivector](#) (int \*v)
- void [free\\_imatrix](#) (int \*\*m, int num\_row)
- int [tr2int](#) (char \*nt)
- int [nt2int](#) (char nt)
- int [nt2int\\_rc](#) (char nt)
- int [trinucleotide](#) (char a, char b, char c)
- void [get\\_protein](#) (char \*dna, char \*protein, int strand, int whole\_genome)
- void [print\\_usage](#) ()

### 4.6.1 Documentatie van functies

#### 4.6.1.1 dmatrix()

```
double** dmatrix (  
    int num_row,  
    int num_col )
```

Hier is de caller graaf voor deze functie:



#### 4.6.1.2 dvector()

```
double* dvector (  
    int nh )
```

#### 4.6.1.3 free\_dmatrix()

```
void free_dmatrix (  
    double ** m,  
    int num_row )
```

Hier is de caller graaf voor deze functie:



#### 4.6.1.4 free\_dvector()

```
void free_dvector (  
    double * v )
```

Hier is de caller graaf voor deze functie:



#### 4.6.1.5 free\_imatrix()

```
void free_imatrix (  
    int ** m,  
    int num_row )
```

Hier is de caller graaf voor deze functie:



#### 4.6.1.6 free\_ivector()

```
void free_ivector (  
    int * v )
```

Hier is de caller graaf voor deze functie:





#### 4.6.1.7 get\_protein()

```
void get_protein (
    char * dna,
    char * protein,
    int strand,
    int whole_genome )
```

Hier is de call graaf voor deze functie:



#### 4.6.1.8 imatrix()

```
int** imatrix (
    int num_row,
    int num_col )
```

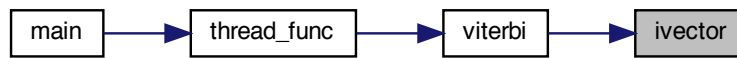
Hier is de caller graaf voor deze functie:



#### 4.6.1.9 ivector()

```
int* ivector (
    int nh )
```

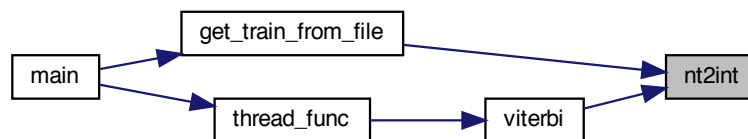
Hier is de caller graaf voor deze functie:



#### 4.6.1.10 nt2int()

```
int nt2int (  
    char nt )
```

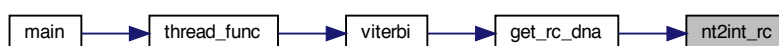
Hier is de caller graaf voor deze functie:



#### 4.6.1.11 nt2int\_rc()

```
int nt2int_rc (  
    char nt )
```

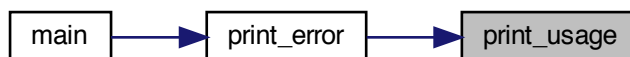
Hier is de caller graaf voor deze functie:



#### 4.6.1.12 print\_usage()

```
void print_usage ( )
```

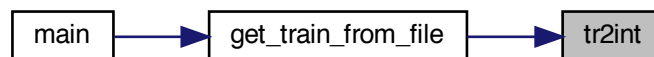
Hier is de caller graaf voor deze functie:



#### 4.6.1.13 tr2int()

```
int tr2int (
    char * nt )
```

Hier is de caller graaf voor deze functie:



#### 4.6.1.14 trinucleotide()

```
int trinucleotide (
    char a,
    char b,
    char c )
```

Hier is de caller graaf voor deze functie:



