

# TOPOLOGICAL WATERSHED

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Generated by Doxygen 1.5.5

Fri Jan 22 08:25:09 2010



# Contents

|          |   |          |
|----------|---|----------|
| <b>1</b> | <b>Main Page</b>                        | <b>1</b> |
| 1.1      | Licence . . . . .                       | 1        |
| <b>2</b> | <b>File Index</b>                       | <b>3</b> |
| 2.1      | File List . . . . .                     | 3        |
| <b>3</b> | <b>File Documentation</b>               | <b>5</b> |
| 3.1      | heightminima.c File Reference . . . . . | 5        |
| 3.2      | minima.c File Reference . . . . .       | 6        |
| 3.3      | pgm2raw.c File Reference . . . . .      | 7        |
| 3.4      | raw2pgm.c File Reference . . . . .      | 8        |
| 3.5      | watershed.c File Reference . . . . .    | 9        |
| 3.6      | wshedtopo.c File Reference . . . . .    | 10       |



# Chapter 1

## Main Page

### 1.1 Licence

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# Chapter 2

## File Index

### 2.1 File List

Here is a list of all documented files with brief descriptions:

|   |    |
|---|----|
| <b>heightminima.c</b> (H-minima operator) . . . . .                   | 5  |
| <b>minima.c</b> (Regional minima) . . . . .                           | 6  |
| <b>pgm2raw.c</b> (Suppress the header from a pgm file) . . . . .      | 7  |
| <b>raw2pgm.c</b> (Converts from raw format into pgm format) . . . . . | 8  |
| <b>watershed.c</b> (Topological binary watershed) . . . . .           | 9  |
| <b>wshedtopo.c</b> (Topological grayscale watershed) . . . . .        | 10 |



# Chapter 3

## File Documentation

### 3.1 heightminima.c File Reference

h-minima operator

#### 3.1.1 Detailed Description

h-minima operator

**Usage:** heightminima in.pgm connex h out.pgm

**Description:** The heightminima operator eliminates those regional minima which have a height less than the value **h**. The regional minima are defined with connectivity **connex**.

**Types supported:** byte 2d, byte 3d

**Category:** connect

**Author:**

Michel Couprie

## 3.2 minima.c File Reference

regional minima

### 3.2.1 Detailed Description

regional minima

**Usage:** in.pgm connex out.pgm

**Description:** Selects the regional minima of a grayscale image with connectivity **connex**.

**Types supported:** byte 2d, int32\_t 2d, byte 3d, int32\_t 3d

**Category:** connect, topogray ,

**Author:**

Michel Couprie

## 3.3 pgm2raw.c File Reference

suppress the header from a pgm file

### 3.3.1 Detailed Description

suppress the header from a pgm file

**Usage:** pgm2raw in.pgm out.raw

**Description:** suppress the header from a pgm file

**Types supported:** byte 2d, byte 3d

**Category:** convert

**Author:**

Michel Couprie

## 3.4 raw2pgm.c File Reference

converts from raw format into pgm format

### 3.4.1 Detailed Description

converts from raw format into pgm format

**Usage:** in.raw rs cs ds headersize nbytespervox littleendian [xdim ydim zdim] out.pgm

**Description:** Converts from raw format into pgm format.

Parameters:

- **in.pgm** : source file in raw format
- **rs** (int32\_t): row size (number of voxels in a row)
- **cs** (int32\_t): column size (number of voxels in a column)
- **ds** (int32\_t): number of planes
- **headersize** (int32\_t): size of the header in bytes (information in the header will be ignored)
- **nbytespervox** (int32\_t): number of bytes per voxel (1, 2 or 4)
- **littleendian** (int32\_t) 1: littleendian, 0: bigendian. Usual choice is 0.
- **xdim** (float, optional) : gap (in the real world) between two adjacent voxels in a row.
- **ydim** (float, optional) : gap (in the real world) between two adjacent voxels in a column.
- **zdim** (float, optional) : gap (in the real world) between two adjacent planes.

**Types supported:** byte 3D, int16\_t 3D, int32\_t 3D

**Warning:**

Signed integers are not supported.

**Category:** convert

**Author:**

Michel Couprie

## 3.5 watershed.c File Reference

topological binary watershed

### 3.5.1 Detailed Description

topological binary watershed

**Usage:** watershed in.pgm mark.pgm connex [i] out.pgm

**Description:** Topological watershed as defined in [CB97,CNB05].

The parameter **connex** indicates the connectivity of the minima. Possible choices are 4, 8 in 2d and 6, 26 in 3d.

A marker image is supplied in **mark.pgm**, see [CNB05a] for the role of this marker..

The result is a binary image, which is the complementary of the set of regional minima of the grayscale topological watershed.

If the parameter **i** is given, then the dual operator is applied.

References:

[CB97] M. Couprie and G. Bertrand: "Topological Grayscale Watershed Transformation", SPIE Vision Geometry V Proceedings, 3168 (136–146), 1997.

[CNB05] M. Couprie and L. Najman and G. Bertrand: "Quasi-linear algorithms for the topological watershed", Journal of Mathematical Imaging and Vision, Vol. 22, No. 2-3, pp. 231-249, 2005.

[CNB05a] M. Couprie and L. Najman and G. Bertrand: "Algorithms for the topological watershed", Discrete geometry for computer imagery, Springer, Vol. 3429, pp. 172-182, 2005.

**Types supported:** byte 2d, byte 3d

**Category:** connect

**Author:**

Michel Couprie

## 3.6 wshedtopo.c File Reference

topological grayscale watershed

### 3.6.1 Detailed Description

topological grayscale watershed

**Usage:** wshedtopo in.pgm connex [i] out.pgm

**Description:** Topological grayscale watershed as defined in [CB97,CNB05].

The parameter **connex** indicates the connectivity of the minima. Possible choices are 4, 8 in 2d and 6, 26 in 3d.

If the parameter **i** is given, then the dual operator is applied.

References:

[CB97] M. Couprie and G. Bertrand: "Topological Grayscale Watershed Transformation", SPIE Vision Geometry V Proceedings, 3168 (136–146), 1997.

[CNB05] M. Couprie and L. Najman and G. Bertrand: "Quasi-linear algorithms for the topological watershed", Journal of Mathematical Imaging and Vision, Vol. 22, No. 2-3, pp. 231-249, 2005.

**Types supported:** byte 2d, byte 3d

**Category:** connect

**Author:**

Michel Couprie

# Index

heightminima.c, 5

minima.c, 6

pgm2raw.c, 7

raw2pgm.c, 8

watershed.c, 9

wshedtopo.c, 10