

# CRITICAL KERNELS Reference Manual

0.1

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# Chapter 1

## CRITICAL KERNELS File Index

### 1.1 CRITICAL KERNELS File List

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

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## Chapter 2

# CRITICAL KERNELS File Documentation

### 2.1 pgm2raw.c File Reference

suppress the header from a pgm file

#### 2.1.1 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

## 2.2 raw2pgm.c File Reference

converts from raw format into pgm format

### 2.2.1 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

## 2.3 skel\_AK2.c File Reference

parallel 2D binary curvilinear skeleton

### 2.3.1 Detailed Description

parallel 2D binary curvilinear skeleton

**Usage:** skel\_AK2 in.pgm nsteps [inhibit] out.pgm

**Description:** Parallel 2D binary thinning or curvilinear skeleton. The parameter **nsteps** gives, if positive, the number of parallel thinning steps to be processed. If the value given for **nsteps** equals -1, the thinning is continued until stability.

If the parameter **inhibit** is given and is a binary image name, then the points of this image will be left unchanged.

Reference: G. Bertrand and M. Couprie, "Two-dimensional thinning algorithms based on critical kernels", *Journal of Mathematical Imaging and Vision*, submitted, 2006. **Preprint:** IGM2006-02.

**Types supported:** byte 2d

**Category:** topobin

**Author:**

Michel Couprie

## 2.4 skel\_ CK3.c File Reference

parallel 3D binary curvilinear skeleton

### 2.4.1 Detailed Description

parallel 3D binary curvilinear skeleton

**Usage:** skel\_ CK3 in.pgm nsteps [inhibit] out.pgm

**Description:** Parallel 3D binary thinning or curvilinear skeleton. The parameter **nsteps** gives, if positive, the number of parallel thinning steps to be processed. If the value given for **nsteps** equals -1, the thinning is continued until stability.

If the parameter **inhibit** is given and is a binary image name, then the points of this image will be left unchanged.

**Types supported:** byte 3d

**Category:** topobin

**Author:**

Michel Couprie

## 2.5 skel\_EK3.c File Reference

parallel 3D binary curvilinear skeleton based on ends

### 2.5.1 Detailed Description

parallel 3D binary curvilinear skeleton based on ends

**Usage:** skel\_EK3 in.pgm nsteps [inhibit] out.pgm

**Description:** Parallel 3D binary thinning or curvilinear skeleton based on ends. The parameter **nsteps** gives, if positive, the number of parallel thinning steps to be processed. If the value given for **nsteps** equals -1, the thinning is continued until stability.

If the parameter **inhibit** is given and is a binary image name, then the points of this image will be left unchanged.

**Types supported:** byte 3d

**Category:** topobin

**Author:**

Michel Couprie

## 2.6 skel\_MK2.c File Reference

parallel 2D binary ultimate skeleton

### 2.6.1 Detailed Description

parallel 2D binary ultimate skeleton

**Usage:** skel\_MK2 in.pgm nsteps [inhibit] out.pgm

**Description:** Parallel 2D binary thinning or ultimate skeleton. The parameter **nsteps** gives, if positive, the number of parallel thinning steps to be processed. If the value given for **nsteps** equals -1, the thinning is continued until stability.

If the parameter **inhibit** is given and is a binary image name, then the points of this image will be left unchanged.

Reference: G. Bertrand and M. Couprie, "Two-dimensional thinning algorithms based on critical kernels", *Journal of Mathematical Imaging and Vision*, submitted, 2006. **Preprint:** IGM2006-02.

**Types supported:** byte 2d

**Category:** topobin

**Author:**

Michel Couprie

## 2.7 skel\_MK3.c File Reference

parallel 3D binary ultimate skeleton

### 2.7.1 Detailed Description

parallel 3D binary ultimate skeleton

**Usage:** skel\_MK3 in.pgm nsteps [inhibit] out.pgm

**Description:** Parallel 3D binary thinning or ultimate skeleton. The parameter **nsteps** gives, if positive, the number of parallel thinning steps to be processed. If the value given for **nsteps** equals -1, the thinning is continued until stability.

If the parameter **inhibit** is given and is a binary image name, then the points of this image will be left unchanged.

Reference: G. Bertrand and M. Couprie, "New 3D parallel thinning algorithms based on critical kernels", *Discrete geometry for computer imagery*, Lecture Notes in Computer Science, Vol. 4245, pp. 580-591, Springer, 2006.

**Types supported:** byte 3d

**Category:** topobin

**Author:**

Michel Couprie

## 2.8 skel\_NK2.c File Reference

parallel 2D binary curvilinear skeleton

### 2.8.1 Detailed Description

parallel 2D binary curvilinear skeleton

**Usage:** skel\_NK2 in.pgm nsteps [inhibit] out.pgm

**Description:** Parallel 2D binary thinning or curvilinear skeleton. The parameter **nsteps** gives, if positive, the number of parallel thinning steps to be processed. If the value given for **nsteps** equals -1, the thinning is continued until stability.

If the parameter **inhibit** is given and is a binary image name, then the points of this image will be left unchanged.

Reference: G. Bertrand and M. Couprie, "Two-dimensional thinning algorithms based on critical kernels", *Journal of Mathematical Imaging and Vision*, submitted, 2006. **Preprint:** IGM2006-02.

**Types supported:** byte 2d

**Category:** topobin

**Author:**

Michel Couprie

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