

Smoothing Filters

Title Smoothing Filters

Description

The “**Smoothing Filters Tool**” provides a selection of standard filtering algorithms that can be used to smooth the DEM and remove, at least partially, noise and artefacts.

Illustration



Usage

The “**Smoothing Filters Tool**” provides direct access to key smoothing filters: MEAN (that calculates the mean value of the cells in the neighbourhood set by the user, MEDIAN (that calculates the median of the cells in the neighbourhood set by the user) and LOW-PASS (that calculates the average value for either a 3 x 3 or 5x5 neighbourhood).

While smoothing filter can be used to remove noise and artefacts, they will also subdue the real signal proportionally to their respective aggressiveness.

Syntax

Smoothing_filter_ (inputDEM, filt_type, {neigh_type}, {distance_1}, {distance_2}, {angle_1}, {angle_2}, outRas)

Parameter	Explanation	Data Type
inputDEM	Dialog Reference The DEM that will be used as input. There is no python reference for this parameter.	Raster Layer
filt_type	Dialog Reference Standard filtering algorithm that will be used smooth the DEM and remove, at least partially, noise and artefacts. <ul style="list-style-type: none">• MEAN — Calculates the mean (average value) of the cells in the neighbourhood set by the user.• MEDIAN — Calculates the median of the cells in the neighbourhood set by the user.• LOW-PASS 3x3 — It calculates the average value for each 3 x 3 neighbourhood.	String

- LOW-PASS 5x5 — It calculates the average value for each 5 x 5 neighbourhood

There is no python reference for this parameter.

neigh_type (Optional)	<p>Dialog Reference</p> <p>The shape of a neighbourhood can be an annulus (a donut), a circle, a rectangle, or a wedge.</p> <ul style="list-style-type: none"> • A circle neighbourhood is created by specifying a outline radius value - distance 1. • The rectangle neighbourhood is specified by providing a width and a height - distance 1 and 2. • The annulus shape is composed of two circles, one inside the other to make a donut shape. The smaller circle is defined by the inner radius (distance 1) and the larger circle is defined by the outer radius (distance 2) • A wedge is a pie-shaped neighbourhood specified by a radius (distance 1), a starting angle (angle 1), and an ending angle (angle 2). <p>There is no python reference for this parameter.</p>	String
distance_1 (Optional)	<p>Dialog Reference</p> <p>In a CIRCLE neighbourhood, is the outline radius.</p> <p>In a RECTANGLE neighbourhood, is the width.</p> <p>In an ANNULUS neighbourhood, is the inner radius.</p> <p>In a WEDGE neighbourhood, is the wedge radius.</p> <p>There is no python reference for this parameter.</p>	Long
distance_2 (Optional)	<p>Dialog Reference</p> <p>In a RECTANGLE neighbourhood, is the height.</p> <p>In an ANNULUS neighbourhood, is the outer radius.</p> <p>There is no python reference for this parameter.</p>	Long
angle_1 (Optional)	<p>Dialog Reference</p> <p>In a WEDGE neighbourhood, is the starting angle.</p> <p>There is no python reference for this parameter.</p>	Long
angle_2 (Optional)	<p>Dialog Reference</p> <p>In a WEDGE neighbourhood, is the ending angle.</p> <p>There is no python reference for this parameter.</p>	Long
outRas	<p>Dialog Reference</p> <p>Output raster name.</p> <p>There is no python reference for this parameter.</p>	Raster Dataset

Code Samples

There are no code samples for this tool.

Tags

Data Preparation; Pre-processing;

Credits

Arosio, R., Gafeira, J. & De Clippele, L. (2023) CoMMa Toolbox - Version 1.0
(<https://github.com/ricarosio/CoMMa/tree/main>)

Riccardo Arosio (University College Cork) and Joana Gafeira (British Geological Survey) conceived the original idea of the new ArcGIS Pro based on a previous toolbox created by Joana Gafeira, the BGS Seabed Mapping Toolbox (Gafeira, J., 2017). Riccardo Arosio wrote the Python scripts while Joana Gafeira and Laurence De Clippele performed extensive testing.

The tools development was mainly funded by INFOMAR through the Irish Marine Institute's research grant PDOC 19/08/03. The British Geological Survey and iAtlantic have also supported the creation of the toolbox.

Use limitations

CoMMa Toolbox may be freely distributed, modified and used commercially under the terms of its GNU LGPLv3 license.

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