Spatial Analysis with GeoAI : : **CHEAT SHEET**

Raster Operations

```
read_raster((raster_path,
band=None, masked = True **kwargs))

get_raster_info(raster_path)

get_raster_info_gdal(raster_path)

print_raster_info(raster_path,show_p
review=True figsize=(8, 10))

clip_raster_by_bbox(input_raster,
output_raster, bbox, bands=None,
bbox_type='geo', bbox_crs=None)

mosaic_geotiffs(input_dir,
output_file, mask_file=None)

create_overview_image(src,
tile_coordinates, output_path,
tile_size, stride,
geojson_path=None)
```

Vector Operations

```
read_vector(vector_path,layer=None**kwargs
)

get_vector_info(vector_path)

Get_vector_info_ogr(vector_path)

print_vector_info(vector_path,
show_preview=True, figsize=(10, 8))

analyze_vector_attributes(vector_path,
attributes=None or attribute_name)

add_geometric_properties(data,
properties=None, area_unit='m2',
length_unit='m')

orthogonalize(input_path,
output_path=None, epsilon=0.2,
min_area=10, min_segments=4,
area_tolerance=0.7, detect_triangles=True)
```

Raster-Vector Conversion

```
raster_to_vector(raster_path, output_path=None,
threshold=0, min_area=10,
simplify_tolerance=None, class_values=None,
attribute_name='class',
unique_attribute_value=False,
output_format='geojson', plot_result=False)

vector_to_raster(vector_path, output_path=None,
reference_raster=None, attribute_field=None,
output_shape=None, transform=None,
pixel_size=None, bounds=None, crs=None,
all_touched=False, fill_value=0, dtype=np.uint8,
nodata=None, plot_result=False)

batch_raster_to_vector(input_dir, output_dir, pa
ttern='*.tif', threshold=0, min_area=10, simplif
y_tolerance=None, class_values=None, attribute_n
ame='class', output_format='geojson', merge_outp
ut=False, merge_filename='merged_vectors'
)
batch_vector_to_raster(vector_path, output_dir,
attribute_field=None, reference_rasters=None, bo
unds_list=None, output_filename_pattern='{vector
_name}_{index}', pixel_size=1.0, all_touched=Fal
se, fill_value=0, dtype=np.uint8, nodata=None
)
masks_to_vector(mask_path, output_path=None, sim
plify_tolerance=1.0, mask_threshold=0.5, min_obj
ect_area=100, max_object_area=None, nms_iou_thre
shold=0.5
)
region_groups(image, connectivity=1, min_size=10
, max_size=None, threshold=None, properties=None
, intensity_image=None, out_csv=None, out_vector
=None, out_image=None
)
```

Regularization and Enhancement

```
regularize(gdf, tolerance=1.0,
preserve_topology=True)

regularization(gdf, tolerance=1.0,
preserve_topology=True)

adaptive_regularization(gdf,
min_tolerance=0.5, max_tolerance=2.0,
area_factor=0.001)

hybrid_regularization(gdf, simplify=True,
orthogonalize=True, tolerance=1.0)

calc_stats(data, metrics=['mean', 'std',
'min', 'max'])
```

Visualization

```
view_raster(source, indexes=None, colormap=None, vm
in=None, vmax=None, nodata=None, attribution=None,
layer_name='Raster', layer_index=None, zoom_to_laye
r=True, visible=True, opacity=1.0, array_args=None,
 client_args{'cors_all': False}, basemap='OpenStree
tMap', basemap_args=None, backend='folium', **kwarg
s)
view_image(image, transpose=False, bdx=None, scale_
factor=1.0, figsize=(10, 5), axis_off=True, title=N
one, **kwargs)

view_vector(vector_data, column=None,
cmap='viridis', figsize=(10, 10), title=None,
legend=True, basemap=False, basemap_type='streets',
alpha=0.7, edge_color='black',
classification='quantiles', n_classes=5,
highlight_index=None, highlight_color='red',
scheme=None, save_path=None, dpi=300)

view_vector_interactive(vector_data,
layer_name='Vector Layer', tiles=None, **kwargs)

visualize_vector_by_attribute(vector_path,
attribute_name, cmap='viridis', figsize=(10, 8))
```