

## GRAPHIS—A free tool to save, annotate and visualise regions in graffiti photos

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### ABSTRACT:

A digital photo file consists of two (or more) parts: one contains the pixel values that encode the visible light reflected from (or emitted by) real-world objects, while one or more file segments hold the metadata. Storing these photo metadata is enabled by various standards. For instance, the [Exif](#) (Exchangeable image file format) standard records technical photo metadata such as the camera's serial number and model, lens aperture and focal length, shutter speed, possible flash compensation, and the date plus time of photo creation. All Exif-defined tags are created by the camera and stored simultaneously upon photo creation.

Besides Exif, [IPTC Photo Metadata](#) exist. These metadata – structured in a standard proposed by the IPTC – are the widely accepted norm for storing administrative, copyright, and descriptive information in images (unedited photos, edited pictures, and AI-generated images). In its 2019.1 version, the IPTC Photo Metadata Standard enabled the storage of image regions. These image regions are shapes like rectangles, circles or any possible polygon that can be marked and saved within an image.

Since the authors are unaware of a tool that allows straightforwardly working with such image regions, and given their potential for graffiti photo annotation, project INDIGO created GRAPHIS. GRAPHIS is an open-source, [freely available](#) Python-based software to create image regions, annotate them with graffiti descriptions or transcriptions, and visualise them. The backbones of GRAPHIS are an SQLite database and ExifTool. Besides storing links to the photos of interest, the [SQLite database](#) keeps track of every image region operation. This principle enables users to start/exit the software at will without the risk of losing work. It also enables collaboration on various photo collections, as each can have its database. At any moment, the user can write the image regions back into the photo's metadata segment, an operation for which GRAPHIS utilises [ExifTool](#).

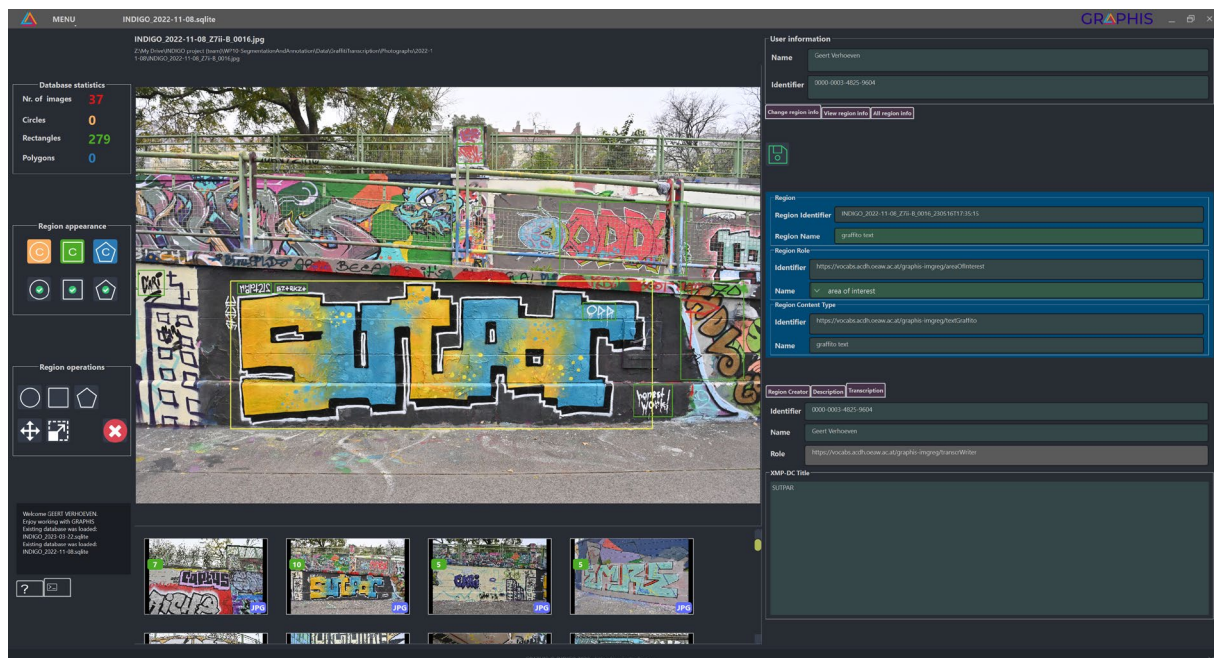


Figure 1. The graphical user interface of GRAPHIS.

GRAPHIS adheres to the IPTC standard at every stage. For example, the IPTC stipulates that every region ideally features a concept that clarifies the role and content type of the region. These concepts must come from a controlled vocabulary: a confined list of terms, each with a definition and a URI. Since none of IPTC's controlled vocabularies features graffiti-related concepts, project INDIGO also created a separate GRAPHIS Image Region vocabulary to contain all relevant concepts. This presentation will first explain the inner workings of GRAPHIS and its underlying vocabulary, after which the software and its functionality will be shown live on some graffiti photographs.