

## INGRID—Archiving Graffiti in Germany

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### Abstract

The article introduces the research project INGRID (Informationssystem Graffiti in Deutschland/ Information System Graffiti in Germany), which was founded in 2016 and provides a scientific database for graffiti. INGRID is an interdisciplinary cooperation project between the Karlsruhe Institute of Technology and the University of Paderborn and offers a systematic registration of graffiti. INGRID contains over 130,000 photographs of graffiti. Different sources provided the images. A large part of the pictures comes from the police departments in Mannheim, Cologne, and Munich. Another part consists of photographs from private collections and public archives.

This paper focuses on INGRID's ontology, the usability of the database, and the annotation and acquisition of graffiti.

Furthermore, there will be a presentation of exemplary studies, which examine the database from a linguistic, a historical and an onomastic perspective. With INGRID, it is possible for the first time to take a look at developments and changes in the phenomenon of graffiti over longer periods based on extensive, secure, and high-quality research data as well as to research its visual aesthetics, its specific scripturality, notational iconicity, grammaticality, urban location as well as its social function and meaning.

### Keywords

archive; art history; document; graffiti; linguistics; ontology

### 1. Introduction

INGRID is a graffiti database within the framework of an interdisciplinary cooperation between art historians at the KIT (Karlsruhe Institute of Technology) in Karlsruhe under the direction of Martin Papenbrock and linguists at the University of Paderborn under the direction of Doris Tophinke. As graffiti is a cultural form with both written and pictorial aspects, a cooperation between linguistics and art history was an obvious choice. Since 2016, the "Information System Graffiti in Germany (INGRID)" has been funded by the DFG (Deutsche Forschungsgemeinschaft/ German Research Foundation). With INGRID, it is possible to look at developments and changes in the phenomenon of graffiti over longer periods based on extensive, secure, and high-quality research data. Furthermore, an important goal of the project has been the cooperation between the academic team and the graffiti scene itself. The creation of the ontology and the annotation of individual photos has been supported by the two local graffiti writers Volker Heisener

and Denis Kelle. 85,709 graffiti are currently accessible for scholarly use from the project website (as of July 2022).

#### 1.1. The first phase

The first phase ran from April 2016 to June 2019. It aimed at building an ontology and terminology to systematically document and analyse graffiti in Germany. The categories created here were derived from the inventories. The creation of this ontology is an ongoing process which is reviewed constantly. Over 40.000 graffiti from Mannheim and Munich were annotated and made accessible for research. The original images of the graffiti may be used publicly under the license CC BY-SA 4.0. Our generated metadata are available under the license CC0. The collection of the police department in Mannheim can be classified as particularly worthy of preservation and especially suitable for scientific research, including approximately 32,000 analogue images (35mm negatives) from 1998 to 2005 and approximately 18,000 digital images from 2006



**Figure 1.** Dedication to the investigation group of the police department in Mannheim.



**Figure 2.** Character by RAY.



**Figure 3.** A dove as a symbol of peace.

to 2014. Based on this collection, it is possible for the first time to document and examine the development of graffiti in a major German city over a period of more than 15 years. Unlike most police investigation groups, the Mannheim investigation group worked operatively. This means that it not only recorded and processed reports, but it also observed and photographed the “hot spots” of the graffiti scene and the typical routes taken by the sprayers. There has been a special relationship between the graffiti scene itself and the investigation group so that dedications and greetings to the members of the police department were also found on the walls (see Figure 1). In addition to the Mannheim collection, it has also been possible to preserve the collection of the ethnologist Peter Kreuzer. As part of a cooperation between INGRID and the Munich City Archive, the slides were digitised and added to the database. These photographs document the very beginning of style writing in Munich (see Figure 2), political graffiti (see Figure 3) and stencils. Furthermore, Peter Kreuzer preserved works of the artist collective Die Aachener Wandmaler and Richard Hambletons Shadowman in Munich.

### 1.2. The second phase

In the second phase, which started in July 2020 and ends in June 2023, more than 50,000 photos of the police departments in Munich and Cologne as well as photos of the private collector Dirk Kreckel will be annotated. The collection of Dirk Kreckel contains photographs taken at famous graffiti hot spots and hall of fames in Germany, for example, the former company grounds of Iveco in Kirchseeon,

the former tank hall in Lüdenscheid, or the Schlachthof in Wiesbaden (see Figure 4). This collection is a useful addition to the photos taken by the police, especially the graffiti sprayed on a hall of fame or in abandoned areas, as these sometimes take on very complex shapes. The collection consists of a total of 14,145 photographs taken in 72 cities in Germany. The photographs from the police department in Munich were captured in and around Munich between 2002 and 2012. Through this inventory, it is possible to examine the development of graffiti in Munich and contrast it with the early phase in the early 80s and the Peter Kreuzer collection, which was registered in the first project phase. The collection of the police department in Cologne contains more than 29,000 photos that were taken between 2002 and 2019. This collection documents the tags and pieces of the graffiti scene in Cologne as well as numerous cases of graffiti by the local football teams 1. FC Köln (see Figure 5), Fortuna Köln and Bayer Leverkusen.

The second phase aims to create a comprehensive RDF knowledge graph (Resource Description Framework) of annotated graffiti images, which is updated constantly. The INGRID knowledge graph was designed to enable search, question answering, and machine learning. With the help of the graph, it is possible to statistically evaluate the meta-data in INGRID and to create queries for questions that cannot be answered with the expert search in the database itself. For example, it is possible to compare the average number of style elements of graffiti in a legal hall of fame with the graffitis that are sprayed illegally. Furthermore, it



**Figure 4.** Wall Street Meeting 1999 @ Schlachthof in Wiesbaden.



**Figure 5.** Football graffiti in Cologne.

is possible, for example, to examine the frequency of the letters within the pseudonyms of the writer and crews in the graffiti culture. It turns out that due to their visual form, certain letters are preferentially sprayed (see Radtke (2020) p. 254). Another aim of the second phase is to test and use crowd-sourcing methods. From May 1st, 2022 to June 30th, 2022 the inhabitants of Paderborn had the opportunity to take photos of graffiti in the city area and upload images to the database INGRID through the app LingScape. The photos were imported into the INGRID database in July 2022 and were shown at an exhibition in September 2022. The accessibility of the data will also be optimised, and free access will be made possible within the second phase. The Kreuzer Collection (3139 graffiti in Munich, photographed between 1983–1985) has been freely accessible since February 2022.

## 2. Process of archiving graffiti

A key point is that the INGRID team does not take photos. The project's approach is rather to identify existing collections, examine their suitability for graffiti research and bring them together in a central database. The images were provided by different sources. A large part of the pictures comes from the police departments in Mannheim, Cologne and Munich. Another part consists of photographs from private collections and public archives. This idea resulted in a long process involving, among others, the legal departments of the participating universities, police investigation groups, police headquarters, state police directories and ministries of justice. Finally, it has been possible to obtain

larger image collections from investigation groups in Cologne, Mannheim and Munich for research. These repositories contain secure and high-quality research data about the place where the graffiti was sprayed and the time when the photo was taken. In order to be able to use the images, a contract was made between the University of Paderborn and the right holders, which transfers the rights for the scientific use of the images to the INGRID project. This agreement allows INGRID users to publish images in a research paper, for example. A part of the collection in Mannheim and the entire image repository of the Kreuzer Collection are available in analogue form. In the first step, they were scanned according to the DFG's digitisation guidelines. The database itself is based on the flexible web application easydb that was configured to meet the needs of the project by the data centre for Information and Media Technology (IMT) at the university of Paderborn under the direction of Gudrun Övel and Heiko Nöthen. In the second step, the annotators of INGRID check the quality and the content of the photo before the process of annotation starts. In some cases, parts of the images are pixelated because they contain personal data. After the annotation is completed, the images are made accessible for research and permanently stored in the library of the University of Paderborn.

## 3. Ontology

In addition to the collection of images, a central task of the INGRID project was to develop standards for research and analysis of graffiti. The development of these standards led to an ontology that captures constitutive aspects of graffiti



Figure 6. Piece by CAN2.

Figure 7. Tag by SCARE.

Figure 8. Character in Mannheim.

(imagery, scripturality, context, locality, materiality, time, actors, etc.). On the one hand, terms and categories are used that are relevant to the scene itself, such as the distinction between different types like piece (see Figure 6), tag (see Figure 7), or character (see Figure 8). On the other hand, these categories are extended by subject-specific categories of the subjects linguistic and art history, such as linguistic constructions, formal techniques and symbols.

The ontology can be divided into three main categories: event, scripturality, and iconicity. The following table shows

these categories and some examples of their subcategories.

By using the advanced search in INGRID it is possible to search for every single category of the ontology. It is also possible to combine the search categories. This allows, for example, searching for pieces with a political message in the database by searching for the categories theme/politics + type/piece. To analyse a graffiti in more depth, the users have the option of collecting individual images in folders. The following table gives an example of a full annotation of the main categories. The example shows a graffiti painted

| Event                                                            | Scripturality                                                             | Iconicity                                                      |
|------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------|
| writer and crew                                                  | function<br>(signing, dedicating, locating...)                            | motif<br>(animal, plant, fantasy...)                           |
| place<br>(city, postal code, context, carrier medium and surface | language<br>(English, German, French...)                                  | letter style<br>(simple style, bubble style, graphic style...) |
| time<br>(recording date and dating given in a graffiti)          | linguistic construction<br>(writer name, finite construction, acronym...) | elements of style<br>(background, crown, outline...)           |
| technique<br>(spray-can, stencil, marker...)                     | character type<br>(letter, number, symbolic mark...)                      | colour                                                         |
| type<br>(piece, tag, character...)                               | theme<br>(music, politics, drugs...)                                      | figure style<br>(linear, flat or modelled)                     |

Table 1. The ontology and its upper categories



Figure 9. Piece by Mason in Dortmund.

| Event                                                                                                                                      | Scripturality                                                           | Iconicity                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------|
| <b>writer and crew</b><br>MASON                                                                                                            | <b>function</b><br>name-calling                                         | <b>motif</b><br>-                                            |
| <b>place</b><br>city: Dortmund<br>postal code: -<br>context: crossing, aggregated<br>carrier medium: wall, train line<br>surface: concrete | <b>language</b><br>English                                              | <b>letter style</b><br>simple style                          |
| <b>time</b><br>15.08.1998                                                                                                                  | <b>linguistic construction</b><br>writer name formed from a proper name | <b>elements of style</b><br>outline, fill-in, sides, bubbles |
| <b>technique</b><br>spraycan                                                                                                               | <b>character type</b><br>letters                                        | <b>colour</b><br>blue, black, white, purple, grey, brown     |
| <b>type</b><br>piece/writing/style                                                                                                         | <b>theme</b><br>-                                                       | <b>figure style</b><br>-                                     |

Table 2. Annotations of Figure 9.

by the writer MASON in Dortmund (see Figure 6).

#### 4. Research Perspectives

The ontology of INGRID examines graffiti from multiple perspectives. The annotation analyse, the use of language, meaning, space, and style. By preserving graffiti and annotating metadata, INGRID helps to answer questions arising within the practice of graffiti writing, for example: What type of languages are used? What is the function and the meaning of a graffito? Which techniques are used? How does a graffito interact with its environment? How has graffiti developed over time?

The database and its annotation system have already been used in research and journal articles. The following part of this paper gives a few examples of research questions based on the INGRID data.

Papenbrock (2017) examines the visual form and the look of tags in Mannheim and contrasts some cases with the tradition of New York tagging in the mid-1970s. He points

out that tagging is about deforming and reshaping letters, putting names in flow and motion, and adding symbols and signs to the pseudonyms. In her PhD thesis, Heidi Pfeifferberger (2018) analyses stylistic characteristics of regional and personal styles in the German cities Mannheim and Karlsruhe. She uses the categories of city and type to examine personal and regional graffiti styles within the framework of art history. Another goal of her thesis is to create a systematic registration of graffiti. Martin Papenbrock (2019) analyses the origins and evolution of style writing in Munich based on the collection of Peter Kreuzer. He outlines how style writing made its way from the subways of New York to the walls of Munich in the early 1980s. One interesting observation was that some early graffiti writers like PHANTOM, HOG105 or ZEPHYR in Munich tended to paint messages instead of their names in the centres of a piece. As examples, Papenbrock mentions Street Spray, Spray of Life or Wild Style.

Radtke (2020) analyses the language and iconography of graffiti pseudonyms within the framework of onomastics,



Figure 10. Piece by SHARK.



Figure 11. Piece by MAREK.



Figure 12. Tag by CRIPS.



Figure 13. A Beat Street Kupfi in Munich.

| type                  | non-standard spelling           | standard spelling                     |
|-----------------------|---------------------------------|---------------------------------------|
| homophone spelling    | punx, kingz or kash             | punks, kings, cash                    |
| colloquial spelling   | Nazis boxn, representin         | Nazis boxen, representing             |
| interlingual spelling | däncer, LSD vorever             | dancer, LSD forever                   |
| regiolectal spelling  | Huschte, a bische tagge, Mannem | Husten, ein bisschen taggen, Mannheim |

**Table 3.** Types of non-standard spelling.

linguistic landscape studies and linguistics. Her research is based on a total of 11,624 photographs of the police department in Mannheim. She demonstrates that graffiti writers in some cases are choosing words with meaning. This forming of pseudonyms is often based on certain semantic fields. The pseudonyms refer to certain semantic concepts. As examples, she mentions the concepts of danger and risk (for example, the pseudonyms SCARE, FEAR, or SHOCK), the concept of strength (for example, POWER, FIST, or STONE) or the concept of courage and daredevil (for example, RAMBOS, REBEL, or RISK). The different types of forms being used to form a name of a writer or a crew can be shown in the database via the category linguistic construction. Within the ontology, a distinction is made between pseudonyms from lexicon words with meaning (see Figure 10 SHARK), proper names (see Figure 11), and neologisms and other forming patterns. Another result of her work was that tags use a pattern-like decorum. This includes the use of crowns, arrows, or quotes (see Figure 12).

Niemann (2022) examines football graffiti of the team SV Waldhof Mannheim in INGRID and their frequency of colours. By combining the categories of theme and colour in the advanced search, he explored that over 60 per cent of the graffiti are using the colours blue and black, the club colours of the team Waldhof. Doing this, this survey analyses the importance of visual aspects in the practice of graffiti. Moreover, Niemann explores the emergence and evolution of the vocabulary and terms in the early graffiti writings in Munich. This analysis has shown that in addition to the English terms toy and bite, the German term Kupferer or Kupfi is also used to insult other writers in the 1980s. Later collections of graffiti in INGRID starting in the mid-1990s no longer include this alternate form. This emergence of a writer's jargon, slang and specific language can be an interesting subject matter for future research. Androutsopoulos

(2000), Wacławek (2011) and Jørgensen (2008), for example, have found out that alternative spellings and languaging play an important role in the practice of graffiti writing and other youth cultures. The users can find examples of over 2000 cases of alternative spellings in the database INGRID. Androutsopoulos (2000, p. 520) argues that non-standard spellings “based on graphic-phonetic relations and on additional formal criteria (...) can be divided into six types”. Table 3 shows examples for different forms of non-standard spelling.

## 5. Conclusions

This article has shown how the database INGRID can help to examine graffiti in Germany over longer periods based on secure high-quality data. The purpose of this article was to identify possible research perspectives for dealing with the verified empirical metadata in INGRID. Based on the analysis conveyed, it can be concluded that the metadata are important for multiple subjects, such as media science, political science, social science, art history, and linguistics. Future exploration can obtain a deeper analysis of textual data that cannot be carried out with the advanced search via the INGRID knowledge graph (IKG). The IKG will be linked to three other knowledge graphs DBpedia, WikiData and LinkedGeoData.

The INGRID database is also an excellent tool for teaching at schools and universities.

In the past few years, the system has already been used in teaching at the University of Paderborn, at the KIT in Karlsruhe, and at the Gymnasium Höhenkirchen Siegersbrunn. In addition to scientific use, the preservation of urban art is also of interest to the fields of art, culture, and tourism. Since 2018, project member Sven Niemann has been leading graffiti tours in Paderborn and, with the support of the tourist information, has created digital tours. This cooper-

ation is creating a closer network of knowledge transfer between the university and the inhabitants of the city of Paderborn. In addition to the support of educational institutions and city tourism, cooperation projects with museums and archives have also emerged in the second phase. It turned out that the preservation of ephemeral art is of great public interest. In 2022 INGRID already supported exhibitions at the Museum Schnütgen, CO3 Galerie and Fort A in Cologne and Minden.

### Conflict of Interests

The author declares no conflict of interests.

### Acknowledgements

All figures have been taken from the INGRID database. Papenbrock, M., Tophinke, D., Doris/Oevel, G., 2016. INGRID – Informationssystem Graffiti in Deutschland. <https://www.uni-paderborn.de/forschungsprojekte/ingrid>.

The following list contains information about the location where the photo was found, the year when the photo was taken and the graffiti object number under which the photo can be found in the database.

- Figure 1: Mannheim 2012, #46184
- Figure 2: München 1983 – 85, #67302
- Figure 3: München 1983 – 85, #65066
- Figure 4: Wiesbaden 1999, #167453
- Figure 5: Köln 2016, #187622
- Figure 6: Unna 2001, #165115
- Figure 7: Mannheim 1998, #116948
- Figure 8: Mannheim 2010, #114716
- Figure 9: Dortmund 1998, #154757
- Figure 10: Dortmund 1998, #154757
- Figure 11: Mannheim 2009, #102194
- Figure 12: Mannheim 2008, #45030
- Figure 13: München 1983 – 85, #64858

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