
000 UN-DOUBLING DIFFUSION: LLM-GUIDED DISAM- 001 002 BIGUATION OF HOMONYM DUPLICATION 003 004

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007 008 ABSTRACT 009

010 Homonyms are words with identical spelling but distinct meanings, which
011 pose challenges for many generative models. When a homonym appears in
012 a prompt, diffusion models may generate multiple senses of the word simul-
013 taneously, which is known as homonym duplication. This issue is further
014 complicated by an Anglocentric bias, which includes an additional transla-
015 tion step before the text-to-image model pipeline. As a result, even words
016 that are not homonymous in the original language may become homonyms
017 and lose their original meaning after translation into English. In this pa-
018 per, we introduce a method for measuring duplication rates and conduct
019 evaluations of different diffusion models using both automatic evaluation
020 utilizing Vision-Language Models (VLM) and human evaluation. Addition-
021 ally, we investigate methods to mitigate the homonym duplication problem
022 through prompt expansion, demonstrating that this approach also effec-
023 tively reduces duplication related to Anglocentric bias. The code for the
024 automatic evaluation pipeline is publicly available.

025 026 1 INTRODUCTION

027 In recent years, diffusion models Ho et al. (2020) have made remarkable progress in the
028 field of image generation; however, they still face challenges in accurately mapping text to
029 images, especially in cases of lexical ambiguity. It occurs when a single word or phrase
030 has multiple meanings, resulting in uncertainty or multiple possible interpretations within
031 a given concise context. A specific instance of lexical ambiguity is homonyms, words that
032 have multiple distinct, unrelated meanings (e.g., “palm” referring to the part of the hand or a
033 type of tree). While humans typically resolve such ambiguities using real-world information,
034 diffusion models often lack access to extended context.

035 Human communication adheres to the single-meaning-per-symbol axiom Rassin et al. (2022),
036 whereby each word in a sentence conveys only one specific meaning and there can be no
037 other. However, as noted in several recent studies Rassin et al. (2022); White & Cotterell
038 (2022), diffusion models exhibit behavior inconsistent with this principle: a single word
039 can be interpreted as two entities (see examples in fig. 1). When a homonym appears in a
040 prompt, in an attempt to satisfy all possible variants of the word, diffusion models adopt
041 a precautionary strategy and generate multiple possible senses within a single image (i.e.,
042 duplication of the homonym is observed). This behavior is attributed to the way CLIP
043 (Contrastive Language–Image Pretraining) Radford et al. (2021) represents homonyms: it
044 encodes each word as a linear superposition of their different meanings White & Cotterell
045 (2022).

046 This problem is further compounded by the prevalence of English data in training sets of
047 image generation models. Such an anglocentric bias results in the homonym duplication,
048 even in cases where the homonym is not present in the original language of the prompt.
049 For example, the Russian non-homonymous word “свидание” (meaning social meeting)
050 translates to the English homonym “date”, which can cause unintended image generations
051 of either the fruit or a calendar date. This behaviour occurs because English is used as
052 the anchor language, and the text encoder processes only the translated prompt, where an
053 original unambiguous word may become a homonym.

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070 Figure 1: Homonym duplication examples. Words in the top row (from left to right):
071 “basket”, “fan”, “bark”. Words in the bottom row: “cricket”, “trunk”, “palm”.
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073 This study aims to quantify the frequency of homonym duplication in diffusion models.
074 We introduce two evaluation methods: automatic ranking with VLM-like and CLIP-like
075 models, and human evaluation via crowdsourcing. Eleven diffusion models are assessed
076 using a novel multimodal homonym benchmark. Additionally, we explore prompt expansion
077 guided by large language models to mitigate homonym duplication, including translation-
078 induced cases. Our source code for automatic evaluation and prompt expansion is publicly
079 available at <https://anonymous.4open.science/r/Un-Doubling-Diffusion-662E/>.

080 Our contributions can be summarized as follows:
081

- 082 • We propose a Human Evaluation (HE) pipeline to measure the frequency of
083 homonym duplication, and use it to quantify duplication rates in several diffusion
084 models.
- 085 • A benchmark of homonyms with their English and Russian senses has been compiled
086 and released as open-source. While this study focuses on English and Russian, the
087 findings may be extended to other languages.
- 088 • We perform VLM-based Automatic Evaluation (AE), while also conducting a com-
089 parative analysis between automatic and human evaluation methods. The source
090 code is publicly available.
- 091 • This study provides the first quantitative evidence that LLM-based prompt ex-
092 pansion reduces duplication rates, including translation-related homonym duplication.

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2 RELATED WORK

095 **Homonym duplication in diffusion models.** Numerous studies have investigated the
096 phenomenon of polysemous words in natural language processing and computer vision, fo-
097 cusing on how these words are represented within models and the behaviors they elicit. Arora
098 et al. (2018) demonstrated that the various meanings of polysemous words are encoded as
099 a linear superposition within the embedding of the word. Consequently, the duplication of
100 homonyms observed in generative models can be attributed to the polysemy that is inher-
101 ently present in embedding spaces. Rassin et al. (2022) conducted the first study devoted to
102 the problem of homonym duplication in diffusion models (specifically in DALLE-2 Ramesh
103 et al. (2022)). The authors utilize a specialized contextual prompt to trigger multi-sense
104 generation and achieve ambiguity in the generated results. However, this work only focuses
105 on DALLE-2 and does not examine other diffusion models. White & Cotterell (2022) in-
106 troduces the term “superposition of homonyms” in the context of image generation with
107 diffusion models. This term refers to the tendency of diffusion models to simultaneously

108 generate visual representations corresponding to all possible senses of a homonym until
109 sufficient disambiguating context is provided.

110 In addition to describing the problem, several studies have focused on developing methods to
111 address homonym duplication. For example, Lee (2021) proposes an approach that involves
112 detecting homonyms in text using word embeddings and replacing them with synonymous
113 words that are not homonyms, thus reducing ambiguity. Mehrabi et al. (2022) propose to
114 use an additional filter language model during generation to determine user intent. The
115 model can ask clarifying questions or produce multiple candidate outputs simultaneously.
116 Furthermore, the authors introduce a benchmark designed to evaluate the effectiveness of
117 disambiguation following user feedback. It is important to note that their work addresses
118 the broader issue of lexical ambiguity rather than focusing specifically on homonyms, which
119 is the primary focus of this paper. The previously mentioned White & Cotterell (2022)
120 proposes using linear algebra techniques to shift the homonym embedding to the desired
121 meaning.

122 **Anglocentrism in generation models.** Models are trained predominantly on English
123 data; consequently, their performance in other languages is lower than in the predominant
124 language (even when the tokenizer accounts for tokens from multiple languages). For exam-
125 ple, Xing et al. (2025) shows that Pixart Alpha Chen et al. (2023) has an average CLIPScore
126 Hessel et al. (2022) on non-English prompts that is 9.2 points lower than on English prompts
127 (29.8 vs 39.0), while translating the prompts from the source language into English increases
128 the metric to 38.3 and 39.7 by two different translators. As a result, current methods for
129 non-English image generation generally use a translation-first approach, where non-English
130 prompts are translated into English prior to processing, as stated in Derakhshani et al.
131 (2025). This approach causes semantic drift, where subtle meanings may shift, and origi-
132 nally unambiguous words can become homonyms after English translation.

133 3 HOMONYM BENCHMARK

134 3.1 HOMONYM LIST COMPILATION

135 **LLM Usage.** We employ LLMs to help with data collection and processing. In particular,
136 LLMs are used to (1) compile the initial list of candidate homonym words, (2) to obtain
137 the most common homonym meanings and their corresponding frequency of use. As a
138 first step, 330 homonym words and 765 corresponding meanings (2 to 5 most common
139 meanings per homonym, including both noun and verb senses) are obtained using modern
140 LLMs: DeepSeek-R1¹ DeepSeek-AI et al. (2025) and GPT-4o² OpenAI et al. (2024). Models
141 are asked to retrieve a list of homonyms (candidates), along with their senses ranked by
142 frequency of use, accompanied by examples for each sense. After that, models validate each
143 other’s candidate lists, and the resulting combined list is sent to experts.

144 Linguists further validate the compiled list by selecting words based on their frequency
145 of use. After compiling the list of homonyms and their meanings, for each meaning, En-
146 glish and Russian definition is taken from open-source resources and dictionaries such as
147 COCA Davies (2015) and BNC Consortium (2007) corpuses, online dictionaries Cambridge
148 University Press (n.d.); Merriam-Webster (n.d.), as well as English homonym dictionaries
149 Malakhovskiy (1995); Gorulko-Shestopalov (2021).

150 3.2 VALIDATION AND VISUAL-BASED AGGREGATION

151 Further processing and verification of the list is carried out manually by experts with a
152 higher education degree in linguistics. To guarantee the highest quality of the final list, we
153 employ a triple overlap method that adheres to specific criteria:

- 154 • **Meaning relevancy.** Preference is given to modern and frequently used meanings.
155 Outdated or highly specialized meanings are excluded.

156 ¹WebUI: chat.deepseek.com; usage window: 22 January–10 February 2025.

157 ²WebUI: chatgpt.com; usage window: 22 January–10 February 2025.

162 • **Feasibility of visual representation.** The final list includes only meanings that
163 can be clearly and unambiguously visualized. For example, the meanings of “well”
164 as a hydraulic structure (visualizable) and as an adverb indicating quality (not
165 visualizable) are excluded. In contrast, the meanings of “mole” as a small mammal
166 and as a dark skin mark (both visualizable) are included.
167 • **Semantic distinction.** Meanings of a homonym must be distinct, not just variations
168 of the same concept. For example, “cart” can mean a small hand-pushed
169 carrier, a horse-drawn vehicle with two or four wheels, or specifically a two-wheeled
170 horse-drawn vehicle. These related senses can be difficult to distinguish in generated
171 images; therefore, they are excluded from the list.
172 • **Meanings are not nested within each other.** For instance, the word “orange”
173 can denote both “the fruit of the citrus tree” and “the color between red and yellow”.
174 Because oranges are inherently orange in color, it is challenging to separate these
175 meanings distinctly. To address this, we exclude such words from our list.

176 Based on these criteria, each expert assigns a rating to each meaning according to the
177 following scale: (0) — does not match the criteria (to be excluded from the final list), (1)
178 — partially matches the criteria (to be discussed), (2) — fully matches the criteria (to be
179 included in the final list). In cases of rating discrepancies, a joint discussion is held using
180 the aforementioned online resources and dictionaries. As a result, the final list comprises
181 171 homonyms, each with its corresponding senses in both English and Russian.
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183 3.3 EXPERTS AND ROLES 184

185 Two groups of experts are involved in the comprehensive development of the dataset:

186 1. **3 linguists** are involved in the creation of the final list of homonyms. The selected
187 experts hold a master’s degree in linguistics, possess relevant professional experience,
188 and are familiar with using LLMs.
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190 2. **2 translators** are involved for validation and enrichment of homonym meanings,
191 initially obtained using LLMs. The translators also hold a master’s degree in lin-
192 guistics, as well as over three years of experience in translation.
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194 4 HUMAN EVALUATION 195

196 4.1 IMAGE GENERATION 197

198 To estimate duplication frequency, it is necessary to generate images for each homonym that
199 will be evaluated for the simultaneous presence of multiple meanings. We explore the follow-
200 ing open-source models: Stable Diffusion 3 (Medium) Esser et al. (2024), Stable Diffusion
201 3.5 (Medium, Large) Esser et al. (2024), Stable Diffusion XL Podell et al. (2023), Pixart
202 (Alpha, Sigma) Chen et al. (2023; 2024), Kandinsky 3 Arkhipkin et al. (2024), Playground
203 2.5 Li et al. (2024), Flux 1 (schnell, dev) Labs (2024), CogView 4 Zheng et al. (2024).

204 We utilize the Hugging Face Diffusers framework von Platen et al. (2022) and configure the
205 generation parameters according to the official model specifications. We set the height and
206 width to 1024 pixels for all generations. Seeds are selected from 0 to 49 inclusive, so that
207 50 generations are performed for each homonym by all models in single-sample inference
208 mode, while maintaining determinism. In total, for all 11 models, we generate $50 \cdot 171 \cdot 11 = 94.050$ images to ensure a reliable evaluation.
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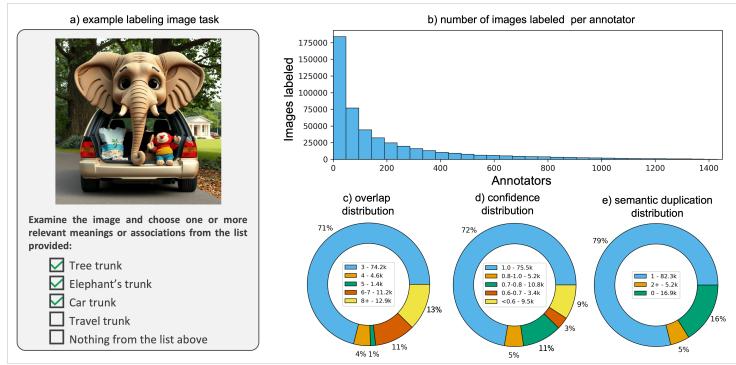
210 4.2 CROWDSOURCE ANNOTATION PIPELINE 211

212 Human evaluations of homonym duplication in the generated images were obtained using
213 the TagMe ³ and Yandex Tasks ⁴ crowdsourcing platforms. To ensure the reliability of
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215 ³<https://tagme.sberdevices.ru>

⁴<https://tasks.yandex.ru>

216 these evaluations, we implemented training and examination phases, along with several
 217 quality control measures, including dynamic overlap aggregation, daily task limits, honeypot
 218 tasks, and response-time blocking mechanisms. For more information on the crowdsourcing
 219 annotation pipeline, please see appendix A.1. Overall, the image labeling task involved
 220 a pool of 1,436 annotators who collectively completed a total of 438,667 samples. Of the
 221 104,450 images, 94,954 (90%) were successfully aggregated. The crowdsourcing task interface
 222 and the annotation statistics can be seen in fig. 2.



236 Figure 2: Annotation characteristics and distribution analysis. a) Crowdsourcing task
 237 interface for image labeling. b) Number of images labeled per annotator. c) Distribution of
 238 annotation overlap. d) Distribution of annotation confidence. e) Distribution of semantic
 239 duplication of annotation.

5 AUTOMATIC EVALUATION

244 Feizi et al. (2025); Yasunaga et al. (2025) demonstrate that the VLM-as-a-judge approach
 245 shows great potential for reliable evaluation in vision-language tasks. We experiment with
 246 automatic evaluation, and use Qwen2.5-VL Bai et al. (2025) as a judge. We sample N
 247 independent sequences per image from the stochastic decoder, parse the binary verdicts,
 248 and compute the empirical probability as in 1, using the indicator function defined in 2
 249 to assign decisions to each sequence. We adopt a chain-of-thought prompt to elicit long,
 250 step-by-step explanations Zhang et al. (2025). From each sequence of VLM responses, we
 251 take the final sentence of the form “DUPLICATE: TRUE” or “DUPLICATE: FALSE” from
 252 which the binary answer v_i is parsed by the deterministic parser π 3.

$$253 \hat{p}(x; \theta) = \frac{1}{N} \sum_{i=1}^N r(y_i), \quad i = 1, \dots, N, \quad (1)$$

$$256 r(y_i) = \mathbf{1}\{v_i = \text{true}\} \in \{0, 1\}, \quad (2)$$

$$258 v_i = \pi(y_i), \quad (3)$$

259 where y_i is the i -th sequence from VLM, x is the prompt (image, text) and θ is the generation
 260 parameters. The overall evaluation pipeline is shown in fig. 3.

261 We experiment with two setups: one-stage and multi-stage inference prompts. The one-
 262 stage prompt directly asks the model if each sense is present in the image. The multi-
 263 stage prompt breaks the task into sequential steps, such as listing objects and analyzing
 264 the meanings of homonyms. For the one-stage setup, we test different ways of verbalizing
 265 homonym meanings: in setup p_1 , each meaning is given with both a Russian translation
 266 and definition; in p_2 , the translation is in Russian but the definition is in English; and in p_3 ,
 267 only the English definition is provided without a Russian translation. In the p_2 setting, the
 268 second language is employed to help the model effectively disentangle the representations of
 269 meanings within the image. Examples of one-stage and multi-stage p_3 prompts, as well as
 the model answer, can be found in appendix A.2.1.

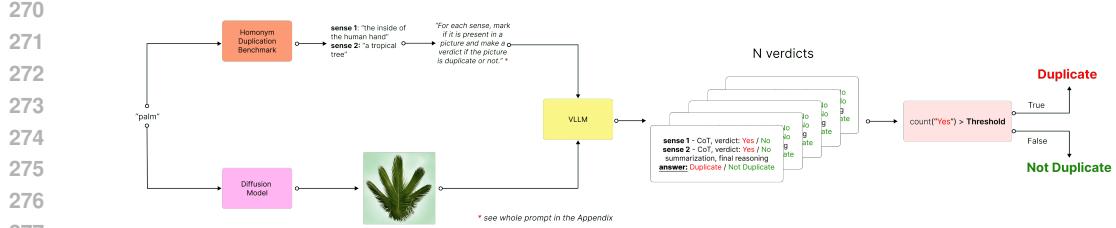


Figure 3: The overall pipeline of automatic evaluation. VLM evaluates images generated for each homonym sense, providing multiple reasoned responses, and images are flagged as duplicates if “duplicate” votes exceed a set threshold.

6 RESULTS

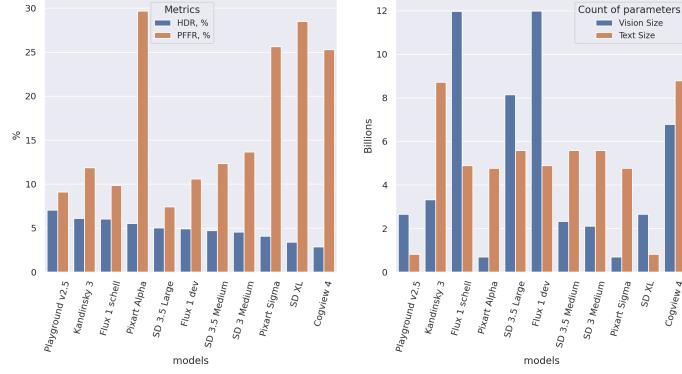


Figure 4: Per-model Homonym Duplication Rate (HDR) and Prompt Following Failure Rate (PFFR) with corresponding model sizes.

We define the Homonym Duplication Rate (HDR) metric 4 as the average duplication percentage of the selected model for each homonym:

$$HDR = \frac{1}{\sum_{i=1}^H K_i} \cdot \sum_{i=1}^H \sum_{j=1}^{K_i} \mathbf{1}\{m(pic_{i,j}) = \text{true}\} \cdot 100\%, \quad (4)$$

where H is the number of homonyms, K_i is the number of generation seeds (K_i is 50 for all homonyms), $pic_{i,j}$ is the j -th image in the row generated for the i -th homonym and m is either human preferences or model evaluation aggregation, depending on the evaluation type (human or automatic). In the case of human preferences, for stability, we define m as a majority vote over the set of options (i.e., if the most frequent response indicates multiple meanings, the image is classified as a duplicate). In contrast, for VLM evaluation, an image is deemed a duplicate if all N of its chains-of-thought (where N is set to 10) contain a “True” verdict.

6.1 HUMAN EVALUATION

The per-model results of human preferences are shown in fig. 4; model sizes are also represented. In addition, we include the Prompt Following Failure Rate (PFFR) metric, which represents the number of cases where workers label the depicted senses as “nothing from the list above”, implying that the model does not follow the prompt. As can be noted, Playground 2.5 is the most frequently duplicating model. Cogview 4 duplicates the least, but it can be attributed to the fact that it rarely follows the prompt, considering the PFFR. It is also worth noting that there is no correlation between HDR and the size of the vision and text components of the model.

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Table 1: Alignment between homonym evaluation and VLM-based automatic evaluation results. We denote AUROC* with an asterisk (*) to indicate the lack of ground-truth labels in this task. Sense representation type indicates the different ways in which homonym senses can be embedded into a prompt (see section 5).

Prompt type	Sense representation type	$r \uparrow$	$\rho \uparrow$	$JSD \downarrow$	$OPA \uparrow$	$AUROC^* \uparrow$
one-stage	p_1	0.269	0.232	0.840	0.919	0.722
	p_2	0.248	0.215	0.849	0.918	0.707
	p_3	0.265	0.232	0.840	0.920	0.718
multi-stage	p_1	0.369	0.338	0.790	0.918	0.830

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6.2 AUTOMATIC EVALUATION

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VLLM-based Evaluation. We measure the alignment of VLLM responses with human evaluation in terms of the Pearson correlation coefficient r , Jensen–Shannon divergence (JSD), Spearman’s rank correlation coefficient ρ , AUROC*, and Overall Percent Agreement (the percentage of total samples for which the two methods produce the same binary outcome). The results can be seen in table 1. Human evaluation results cannot be considered ground truth due to task complexity, as one in ten images lacked consensus among crowd workers (section 4). Nevertheless, to assess the alignment between human and automatic evaluations, we compute AUROC, treating human labels as the ground truth, denoted as AUROC* to highlight this distinction. Despite low correlation coefficients, the overall percent agreement (OPA) is high due to class imbalance, as 95% of images are labeled as non-duplicates according to human evaluation (fig. 2(e)).

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Ablation Study on different sense representation types. We calculate the alignment metrics between automatic evaluation results with different sense verbalization types in the prompt, as described in section 5. The results are shown in table 2. The correlation between the metrics is moderate overall: a relatively strong correlation is observed between p_1 and p_2 , while the correlations between p_1 and p_3 and between p_2 and p_3 are weaker. The JSD values for these comparisons are below the moderate threshold of 0.5.

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CLIP-based Evaluation. Additionally, we assess three CLIP-like rankers as a tool for the automatic evaluation of homonym duplication and compare the obtained metric with human evaluation results. We utilize two multilingual SigLIP models Zhai et al. (2023); Tschanne et al. (2025) as well as the OpenAI CLIP L-14 model Radford et al. (2021). One can observe a negligible correlation between CLIPScores and human judgments in terms of correlations (see table 4 in the Appendix). Across models, the highest AUROC* occurs with top-2 (second-highest CLIPScore), matching one-stage VLM inference but falling short of multi-stage. This discrepancy stems from CLIP’s limited ability to handle cases where meanings are linked through associations.

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6.3 PROPER NAME BIAS

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In certain cases, the model demonstrates a bias toward proper names. For instance, when given the word “stitch”, the model frequently produces the cartoon character named Stitch. Similarly, for the word “bat”, it often generates the character Batman, even though the words “bat” and “Batman” are spelled differently. In the Appendix, table 5 presents several examples comparing the frequency of proper name generation relative to other meanings; the HDR metrics are obtained through human evaluation for all 11 diffusion models. Generations depicting this bias can be seen in fig. 7.

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7 LLM-BASED PROMPT EXPANSION

Studies show that techniques such as prompt beautification Arkhipkin et al. (2024) and prompt expansion Datta et al. (2023) enhance image aesthetics and diversity. We aim

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Table 2: Ablation study of the correlation between automatic evaluation for different sense
representation types in the prompt.

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390 to demonstrate that using a pretrained LLM to expand single-word ambiguous prompts
391 lowers duplication rates in diffusion-based generation. We utilize the compiled homonym
392 benchmark (see section 3) and, for each of 171 words, iterate the seed from 0 to 49 to
393 generate expanded text sequences with the LLM, which are then used as prompts for the
394 diffusion model. We intend to demonstrate a working proof of concept using a single Pixart
395 Alpha model, rather than replicating the demonstration across all models, which would
396 double the annotation effort.

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398 We prompt Qwen3-A3B-30B Yang et al. (2025) model to write an expanded text-to-image
399 generation prompt for each homonym word, and measure the resulting HDR. Specifically, we
400 calculate the count of duplicates over 50 generations for each homonym and then aggregate
401 these rates across all homonyms. We compute the HDR using human evaluation and auto-
402 matic evaluation. According to human evaluation, the HDR metric scores are 5.54 before
403 prompt expansion and 5.03 (−9.2%) after, while automatic evaluation yielded scores of 9.58
404 and 5.66 (−41%), respectively. One can observe a decrease in HDR after the prompt ex-
405 pansion, regardless of the evaluation method, indicating that LLM-based prompt expansion
406 can effectively alleviate the duplication problem.

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410 To study Anglocentrism related to homonym duplication, we simulate a pipeline generating
411 images from short, unambiguous non-English prompts (in Russian). Our primary goal is to
412 determine the frequency of unintended or duplicated meanings. For the experiment, we uti-
413 lize homonyms collected from our benchmark along with their corresponding short Russian
414 translations. To ensure a valid comparison, we apply the following criteria: (1) homonyms
415 that include at least one verb sense are excluded, as single-word verbs are less likely to
416 be used as prompts; (2) all English translations of homonyms are verified to be consistent
417 with the Russian source through back-translation. Specifically, the madlad-7b translator
418 Kudugunta et al. (2023) in Russian-English mode is used to obtain the English homonyms.
419 After following these steps, we obtain 37 senses of 17 homonym words that have a bipartite
420 English-Russian matching: each meaning’s English translation reversely translates into the
421 same Russian word, establishing a bidirectional one-to-one mapping between their mean-
422 ings across languages. We expand the prompt using a method similar to that described in
423 section 7, with the expansion applied to the Russian input text before the translation.

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407 8 ANGLOCENTRISM AS A RELATED PROBLEM
408409 To study Anglocentrism related to homonym duplication, we simulate a pipeline generating
410 images from short, unambiguous non-English prompts (in Russian). Our primary goal is to
411 determine the frequency of unintended or duplicated meanings. For the experiment, we uti-
412 lize homonyms collected from our benchmark along with their corresponding short Russian
413 translations. To ensure a valid comparison, we apply the following criteria: (1) homonyms
414 that include at least one verb sense are excluded, as single-word verbs are less likely to
415 be used as prompts; (2) all English translations of homonyms are verified to be consistent
416 with the Russian source through back-translation. Specifically, the madlad-7b translator
417 Kudugunta et al. (2023) in Russian-English mode is used to obtain the English homonyms.
418 After following these steps, we obtain 37 senses of 17 homonym words that have a bipartite
419 English-Russian matching: each meaning’s English translation reversely translates into the
420 same Russian word, establishing a bidirectional one-to-one mapping between their mean-
421 ings across languages. We expand the prompt using a method similar to that described in
422 section 7, with the expansion applied to the Russian input text before the translation.423 For translated original and expanded prompts, images are generated by the Playground
424 2.5 model. An illustration of the prompt expansion pipeline for a non-English prompt is
425 provided in fig. 5. To measure the effect of prompt expansion, we calculate two metrics:
426 the homonym duplication rate (note that homonyms appear in the English translation) and
427 the wrong sense rate (WSR). The WSR represents the proportion of instances where the
428 model generates images reflecting an unintended homonymous meaning rather than the one
429 intended by the user. The results are presented in table 7 in the Appendix. The average
430 WSR decreases significantly after prompt expansion, dropping from 50% to 22%. That is,
431 without prompt expansion techniques, a non-English-speaking user encounters an alternative
(unrequested) sense in 50% of generations. Prompt expansion in the source language before
translation improves the situation significantly. Concurrently, the HDR also reduces from an

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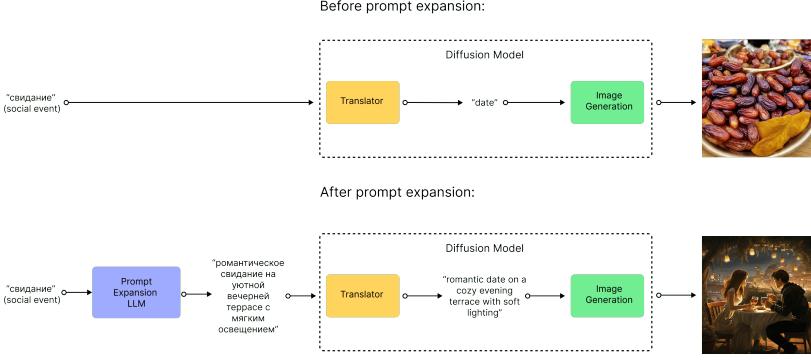


Figure 5: The example of a prompt expansion pipeline for non-English prompts (in this case, Russian) to avoid homonym duplication and sense entanglement caused by translation.

average of 16.5% to 8.9%. These results indicate that prompt expansion effectively mitigates issues related to homonym duplication that occur when translating into English.

9 LIMITATIONS AND FUTURE WORK

Perception bias. Identifying duplicates is a complex task heavily influenced by individual perceptions and associations. It is not always possible to make definitive judgments for all images. To simplify the evaluation, certain words and their specific meanings, as described in section 3.2, were excluded from consideration. This approach diminishes the uncertainty but does not eliminate it. The examples of easy and complex cases can be found in fig. 6 in the Appendix.

Absence of sense frequencies. Another limitation of our study is that the selection of individual homonym senses mentioned in section 3.1 is based on approximate frequency estimates due to the absence of publicly available statistical data. A possible direction for future research would be to analyze English language corpora to determine the actual frequency of each sense for homonymous words.

Alternative image generation methods. In this work, we focus specifically on the issue of homonym duplication in diffusion models, excluding other image generation approaches such as autoregressive models (e.g., Tian et al. (2024)) from our scope. The behavior of these models when processing homonyms in prompts may differ substantially and could require alternative solutions, representing a valuable direction for future research.

Sensitive content. To avoid unintentional distribution of potentially unacceptable (NSFW) material, we do not publish the generated images. Since single-word homonyms involve few tokens, models, which are trained on average token counts of 15–18 Wu et al. (2024); Byeon et al. (2022), may still output sensitive content. Prior work Betker et al.; Chen et al. (2024); Esser et al. (2024) confirms that training on long synthetic descriptions improves metrics but worsens out-of-distribution issues when inferring from few tokens, supporting our concern.

10 CONCLUSION

This paper addresses the challenge of homonym duplication in diffusion models. Our proposed benchmark and comprehensive evaluations provide a systematic framework for quantifying duplication rates across different models. To the best of our knowledge, this is the first study to investigate the homonym duplication problem in the context of the Anglocentric bias in image generation models. We also demonstrate that prompt expansion effectively reduces duplication, including translation-related cases. These findings contribute valuable insights toward improving the reliability of text-to-image generation systems, and the publicly available evaluation pipeline offers a practical tool for future research in this area.

486 11 ETHICS STATEMENT
487

488 Certain words were excluded from consideration due to ethical concerns. For instance, the
489 word “race” often leads models to reproduce racial biases by generating images of people of
490 color in racing attire. Detecting duplicates in such cases is challenging without perpetuating
491 these biases. Therefore, the word “race” was omitted from our benchmark.

492 All crowd workers participating in the benchmark creation were fairly compensated. Since
493 homonym duplication labeling is non-trivial and heavily influenced by individual associa-
494 tions, workers were still paid even if they were blocked after making an error in the verifi-
495 cation honeypot task (see appendix A.1 for more information).

496
497 12 REPRODUCIBILITY STATEMENT
498

500 To perform VLM-based evaluation, we use the vllm framework Kwon et al. (2023) ver-
501 sion 0.10.0. Even when employing greedy decoding with a temperature of 0 and fixing
502 the seed, strict determinism is not guaranteed by the official vllm documentation⁵. To
503 address this limitation and enhance the reliability of the metrics, we generate and eval-
504 uate N sequences per image, as described in section 5. For all generation tasks (in-
505 cluding image generation and prompt expansion in both English and Russian) we set
506 seeds ranging from 0 to 49 inclusive to ensure complete determinism. It is important
507 to note that, for prompt expansion, the seed used to generate each expanded prompt is
508 recorded and subsequently applied to generate the corresponding image within the origi-
509 nal pipeline. To ensure reproducibility, we provide the complete source code for all stages
510 of this work, including VLM evaluation, image generation, prompt expansion, and met-
511 ric calculation, as well as the specifications for the conda environment requirements at
<https://anonymous.4open.science/r/Un-Doubling-Diffusion-662E/>.

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766 767 A APPENDIX

768 A.1 CROWDSOURCE ANNOTATION PIPELINE

769 As stated in section 4, we utilized crowdsourcing platforms to perform human evaluation. A
770 key advantage of the crowdsourcing approach is its capacity to gather annotations from a de-
771 mographically and professionally heterogeneous group of participants, mitigating potential
772 biases inherent in homogeneous annotator pools. The task instructions required crowdwork-
773 ers to view an image and select all applicable associations and semantic duplications from
774 a provided list, or to indicate that the image contained no such associations.
775

776 A.1.1 PARTICIPANTS SELECTIONS.

777 A two-stage system involving training and exam tasks is used to select crowdworkers. The
778 training and exam tasks are based on pre-defined, unambiguous correct answers.
779

780 **Training.** The purpose of the training phase is to screen crowdworkers for their ability to
781 understand the instructions and navigate the task interface. The training phase consists of
782 five tasks. A total of 7,765 crowdworkers began the training phase, but only 6,477 correctly
783 completed at least three tasks, meeting our 50% accuracy threshold.
784

785 **Exam.** Crowdworkers who achieve a score of more than 50% correct answers in the training
786 phase are admitted to the qualification exam. The exam consists of 21 tasks. As in the
787 training phase, these tasks feature pre-defined gold-standard tasks with unambiguous correct
788 answers. A total of 6,477 crowdworkers began the exam phase; 5,297 completed all 21 tasks,
789 but only 1,138 correctly completed at least 18 tasks, meeting our 85% accuracy threshold.
790

791 A.1.2 IMAGES ANNOTATION.

792 Access to the main annotation tasks is granted only to crowdworkers who achieve an exam
793 accuracy score of at least 85%. Since we have not screened the images for potentially NSFW
794 content (see more details in section 9), the task pool requires participants to be 18 years
795 or older. To enhance the quality of image annotation, three safeguard mechanisms are
796 implemented: (1) rapid responses — annotators who label images too quickly (in less than
797 1 second) are temporarily blocked for 14 days+, (2) daily task limit — each annotator is
798 assigned no more than 200 tasks per day to ensure user heterogeneity, (3) honeypot tasks —
799 main tasks are interspersed with honeypot tasks (pre-annotated items with known correct
800 answers), incorrect responses to honeypot tasks lead to the annotator’s block. Honeypot
801 tasks are introduced with a 10% probability per task assignment. In total, the unique set
802 of honeypot images accounted for roughly 2% (~ 2000 images) of the dataset.
803

804 A.1.3 LABELING AGGREGATION.

805 For reliable image annotation, we apply a dynamic overlap approach. The initial overlap for
806 each image is set to 3, i.e., each image is independently annotated by at least three different
807 annotators. If the required response agreement is below 0.7, the overlap is increased until the
808 desired agreement level is reached. The maximum overlap is set to 9; for overlaps of 8 and 9,
809 the response agreement threshold is lowered to 0.6. The responses are considered consistent

810 only if they match exactly: both the specific associations selected from the proposed list
811 and the number of associations provided. Images that do not reach the required agreement,
812 even with 9 responses, are labeled as “not_aggregated”.

813

814 A.1.4 CHARACTERISTICS. 815

816 The image labeling task involved annotators ranging in age from 18 to 94 years, who collec-
817 tively completed a total of 438,667 assignments and 57,822 honeypot tasks. Of the 104,450
818 images, 94,954 were successfully aggregated. The required inter-annotator agreement could
819 not be achieved for 9,496 images. On average, annotators spent 3.8 seconds labeling each
820 image. A total of 455 annotators were disqualified as a result of failing honeypot assign-
821 ments.



834 Figure 6: Two hard and one easy labeling examples. From left to right: “bark”, “pot”,
835 “crane”. The first two examples are considered difficult to label as duplicates since their
836 meanings are linked implicitly through an association. The animal depicted in the first
837 image, appearing to emerge from the tree bark, resembles a cat. Although cats are known
838 not to bark, the cat’s presence may evoke associations with a barking dog, thereby justifying
839 the classification of the image as a duplicate. The word “pot”, which is depicted in the
840 second image, has 4 different meanings (flower pot, tea pot, saucepan, boiling pot), making
841 it challenging to reliably identify which meanings are actually depicted in the image. The
842 last example is easy to label since there is no second meaning present, and the image is
843 clearly not a duplicate.

844

845 A.2 PROMPT EXAMPLES

846

847 A.2.1 VLLM-BASED AUTOMATIC EVALUATION

848

849 Example of one-stage prompt for duplicate detection

850 There is a problem, which is called as Homonym Duplication. It is when in the
851 image, which was generated by text2image model, there are several senses of the
852 input prompt. This image is generated by a neural network for a multi-senses
853 short prompt: ``basket''. This prompt can take several values:

854 1) a wicker item that serves as a storage, packing or carrying case. It is
855 usually a handicraft, the methods of making which vary from region to region.
856 2) a structure made of a metal ring with a net hanging from it for throwing the
857 ball. It is used for playing basketball. Possibly there are other values. The
858 meaning of the homonym may be implicit in the picture. For each meaning, reason
859 step-by-step and mark the presence in the picture and provide the answer in the
860 following template:

861 sense_1: [Explicit|Implicit|Absent], justification

862 sense_2: [Explicit|Implicit|Absent], justification

863 ...

864 [Reasoning, summarization].

865 DUPLICATE: [TRUE|FALSE].

864 An image may be connected to a meaning implicitly, through association or
865 related meaning. Therefore, be very attentive and carefully study the picture
866 for the presence of the listed meanings, even if they are presented implicitly.
867 Note:
868 * Implicit covers metaphors, hints, visual puns.
869 * Base judgments only on what is visible (including any text shown).
870 * Base your final words in answer as DUPLICATE: TRUE, or DUPLICATE: FALSE.

871
872
873

874 Example of multi-stage prompt for duplicate detection

875 You are analyzing an image generated by a diffusion model for potential Homonym
876 Duplication.
877 TASK: Determine if this image contains multiple meanings of the word
878 ``basket''.
879 STEP 1 - VISUAL INVENTORY
880 List all objects, elements, and visual features you observe in the image.
881 STEP 2 - MEANING ANALYSIS
882 The word ``basket'' can have these meanings:
883 1) a wicker item that serves as a storage, packing or carrying case. It is
884 usually a handicraft, the methods of making which vary from region to region.
885 2) a structure made of a metal ring with a net hanging from it for throwing the
886 ball. It is used for playing basketball. Possibly there are other values.
887 For each meaning, analyze:
888 - EXPLICIT presence: Direct visual representation
889 - IMPLICIT presence: Suggested through context, associations, or related
890 elements
891 - ABSENT: No connection to this meaning
892 Format:
893 meaning_X: [EXPLICIT|IMPLICIT|ABSENT] - detailed justification
894 STEP 3 - ASSOCIATION MAPPING
895 Check for indirect connections:
896 - Visual metaphors or symbols
897 - Contextual clues that suggest meanings
898 - Objects that relate to but don't directly represent meanings
899 STEP 4 - FINAL DETERMINATION
900 Count meanings with EXPLICIT or IMPLICIT presence.
901 If 2 meanings present: DUPLICATE: TRUE
902 If < 2 meanings present: DUPLICATE: FALSE
903 Provide your structured analysis following each step.

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Model answer example

906 sense_1: Absent, justification
907 The image does not contain any elements that explicitly or implicitly suggest a
908 bass guitar. There are no musical instruments, strings, or any related imagery
909 present.
910 sense_2: Explicit, justification
911 The image clearly depicts a fish, specifically one resembling a bass fish.
912 The underwater setting, coral reefs, and the fish's features such as its fins,
913 scales, and open mouth are all consistent with the depiction of a bass fish.
914 [Reasoning, summarization].
915 The image contains an explicit representation of a bass fish, aligning with
916 the second sense of the word ``bass''. There is no indication of the first
917 sense, which refers to a bass guitar. Since the image only represents one
of the possible meanings of the word ``bass'', it does not exhibit homonym
duplication.
DUPLICATE: FALSE.

918 A.2.2 PROMPT EXPANSION

919 Example of the prompt used to expand the original single-word prompts

920 You are a prompt engineer. Your mission is to expand prompts written by user.
 921 You should provide the best prompt for text to image generation in English in
 922 1-2 sentences. You MUST INCLUDE given word in its original form in a prompt.
 923 Expand prompt for this word: ``bass''. Respond ONLY WITH the example of an
 924 expanded prompt, nothing else.
 925

926 Example of the expanded prompt for the word “bass”

927 A serene lake at sunrise, with a sleek bass leaping out of the water,
 928 surrounded by lush greenery and mist.
 929

930 A.3 NAMED ENTITY BIAS



931
 932 Figure 7: Examples of named entity bias. On the left, the image generated for the prompt
 933 “beetle” depicts a car resembling a Volkswagen Beetle in the form of an actual insect. On the
 934 right, the image for the prompt “jelly” shows a girl (interpreting “Jelly” as a female name)
 935 morphing into jelly.
 936

937 A.4 ADDITIONAL TABLES

938 Table 3: Distribution of homonym duplication in an image by
 939 homonyms. We present statistics on the checkboxes: no selection,
 940 one selection, and two or more selections.
 941

942 homonym	943 General			944 Prompt Expansion		
	945 nothing	946 one	947 two+	948 nothing	949 one	950 two+
951 agent	5.8	94.2	0	2	98	0
952 anchor	0.9	99.1	0	0	100	0
953 angle	61.5	38.5	0	86	14	0
954 ash	72.4	26	1.6	0	40	60
955 baby	0.2	99.5	0.3	0	100	0
956 ball	6	84.2	9.8	22	58	20
957 band	3.5	96.5	0	0	100	0
958 bank	7.1	92.4	0.5	0	100	0

Table 3: Distribution (%) of homonym duplication in an image by homonyms (continuation).

homonym	General			Beautification		
	nothing	one	two+	nothing	one	two+
bar	0.4	99.6	0	0	100	0
bark	1.6	89.3	9.1	0	98	2
barrel	0.2	99.5	0.3	0	100	0
basket	0.7	91.8	7.5	0	100	0
bass	3.5	92.7	3.8	2	98	0
batter	31.1	68.9	0	8	92	0
bead	1.1	95.8	3.1	0	84	16
beam	28.2	66.2	5.6	0	96	4
bed	0	99.8	0.2	0	100	0
bench	1.1	96.7	2.2	2	96	2
berth	45.6	53.8	0.6	4	96	0
block	14.4	71.6	14	0	94	6
blow	44.2	51.8	4	78	18	4
boil	15.5	84.5	0	10	90	0
bolt	51.8	47.5	0.7	4	94	2
bow	18.5	81.1	0.4	62	38	0
bowl	0	99.5	0.5	0	100	0
box	6	93.6	0.4	2	96	2
brush	26.5	61.3	12.2	12	82	6
buck	0.4	99.6	0	0	100	0
bucket	2.4	96.7	0.9	0	100	0
bug	3.1	96.9	0	0	100	0
button	5.5	68.7	25.8	2	54	44
cane	18.7	77.8	3.5	10	90	0
canvas	6.5	92	1.5	26	74	0
cape	10	69.5	20.5	0	16	84
capital	6.5	51.3	42.2	0	100	0
case	66.9	28.2	4.9	30	60	10
cell	46.2	53.8	0	0	100	0
charm	30.2	67.8	2	48	52	0
chest	4	88.9	7.1	0	100	0
chip	19.5	77.3	3.2	14	86	0
clove	53.1	46.9	0	18	82	0
club	33.8	61.1	5.1	2	92	6
coach	36	63.1	0.9	8	90	2
cobbler	25.3	74.4	0.3	8	92	0
collar	2.5	68	29.5	4	72	24
court	24.2	74.5	1.3	36	62	2
crane	0	97.5	2.5	0	100	0
cricket	9.8	89.5	0.7	0	100	0
crown	1.6	98.2	0.2	0	100	0
date	44.4	48.7	6.9	4	96	0
deck	6.9	83.8	9.3	0	100	0
diamond	0.2	42.4	57.4	0	62	38
ear	3.6	96.4	0	38	60	2
fan	30.9	66.2	2.9	18	80	2
fence	0.4	99.6	0	0	100	0
file	73.6	26.4	0	36	64	0
flask	10.5	81.6	7.9	0	96	4
flute	10.4	89.5	0.1	22	78	0
font	26.7	69.5	3.8	24	76	0
fork	6.4	93.5	0.1	12	84	4
funnel	9.3	78.5	12.2	40	60	0

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Table 3: Distribution (%) of homonym duplication in an image by homonyms (continuation).

homonym	General			Beautification		
	nothing	one	two+	nothing	one	two+
gate	0.4	99.6	0	0	100	0
ghost	0.4	73.3	26.3	0	20	80
gin	13.5	86.5	0	0	100	0
glasses	0.5	98.2	1.3	2	98	0
ground	3.8	76.5	19.7	0	80	20
gum	27.8	62.5	9.7	50	50	0
hatch	47.5	50.4	2.1	62	38	0
heel	6	34.5	59.5	2	62	36
horn	6.4	78.9	14.7	2	98	0
jam	33.3	66.5	0.2	14	86	0
jar	0.2	98.9	0.9	0	100	0
jet	9.5	80.5	10	0	94	6
jumper	4.9	74.9	20.2	2	98	0
junk	32	67.6	0.4	10	90	0
lace	0.5	99.1	0.4	0	100	0
leg	7.8	77.1	15.1	0	96	4
line	33.8	56	10.2	30	48	22
litter	22.2	74.2	3.6	0	100	0
lock	3.3	96.7	0	2	98	0
log	21.8	78.2	0	0	100	0
magazine	24	76	0	10	90	0
mail	10.5	89.5	0	2	98	0
match	46.2	48.4	5.4	4	80	16
mate	25.6	74.2	0.2	8	92	0
mine	71.5	24.7	3.8	4	88	8
mint	17.5	82.4	0.1	4	96	0
model	12	88	0	18	82	0
mold	16.9	82.9	0.2	18	82	0
mole	24.9	66	9.1	14	86	0
mouse	0	98.9	1.1	0	100	0
mug	1.3	90.9	7.8	0	98	2
nail	6.4	93.5	0.1	4	96	0
needle	23.3	52.5	24.2	20	70	10
net	16.7	75.3	8	28	32	40
note	22.4	76.5	1.1	0	98	2
notebook	7.1	92	0.9	0	100	0
nut	17.6	81.1	1.3	0	100	0
oil	24.7	66.7	8.6	44	52	4
organ	16.5	83.1	0.4	30	70	0
pack	26.2	70.9	2.9	0	98	2
palm	0	95.3	4.7	0	100	0
park	0.2	97.6	2.2	0	100	0
party	0.5	99.5	0	0	100	0
pen	21.8	78.2	0	0	100	0
pipe	2.4	93.1	4.5	14	86	0
pitcher	6.4	92.7	0.9	0	100	0
plane	0	99.8	0.2	0	100	0
plant	0	100	0	0	100	0
plate	0.5	99.5	0	34	66	0
plot	31.5	67.1	1.4	16	84	0
plug	11.6	88.2	0.2	98	2	0
pod	61.3	36.7	2	8	92	0
pole	7.6	92.4	0	2	98	0

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Table 3: Distribution (%) of homonym duplication in an image by homonyms (continuation).

homonym	General			Beautification		
	nothing	one	two+	nothing	one	two+
pool	0.2	99.5	0.3	2	98	0
pot	4.7	82.5	12.8	0	96	4
press	54.7	42.5	2.8	24	48	28
pump	13.1	86.4	0.5	30	70	0
quiver	44.9	54.5	0.6	84	16	0
rail	5.3	90.4	4.3	0	98	2
ring	0.5	99.5	0	0	100	0
roll	18.9	78.2	2.9	62	38	0
row	31.3	52.2	16.5	30	66	4
rug	14.2	72.4	13.4	0	80	20
ruler	12.2	87.5	0.3	12	88	0
scale	21.8	69.5	8.7	14	86	0
screen	16.7	80.9	2.4	24	76	0
seal	9.5	78.4	12.1	0	100	0
sewer	2.2	97.8	0	2	98	0
sheet	17.3	78.2	4.5	18	82	0
shower	13.1	85.3	1.6	22	74	4
sink	6.5	92.5	1	2	98	0
skate	0.7	97.8	1.5	0	100	0
skeleton	0	100	0	4	96	0
slough	35.8	64.2	0	0	100	0
sole	40.9	45.8	13.3	6	90	4
sow	38.5	61.5	0	0	100	0
space	0.2	99.6	0.2	0	100	0
spirit	28.4	71.6	0	4	96	0
spoon	2.5	97.3	0.2	4	96	0
spring	0.2	83.6	16.2	0	20	80
spur	81.1	18.9	0	10	90	0
square	10.9	76.5	12.6	2	88	10
squash	0.4	99.1	0.5	4	96	0
staff	14.2	85.3	0.5	18	82	0
stamp	1.5	85.6	12.9	8	82	10
store	0.4	82	17.6	0	100	0
straw	5.1	90.2	4.7	8	92	0
string	14.5	82.4	3.1	68	30	2
table	0.4	99.6	0	0	100	0
tail	27.6	71.5	0.9	2	98	0
tank	0.4	99.1	0.5	0	100	0
tear	36.2	61.3	2.5	44	56	0
temple	0	100	0	0	100	0
tick	34.5	64.4	1.1	22	78	0
tie	23.5	76.5	0	6	94	0
tip	83.5	16.5	0	30	70	0
toast	6.7	92.7	0.6	0	100	0
track	38.5	51.5	10	4	84	12
train	0.4	99.6	0	0	100	0
trunk	12	72.2	15.8	0	88	12
urn	11.1	88.9	0	0	100	0
vane	75.1	22.4	2.5	0	88	12
veil	0.9	97.3	1.8	0	46	54
vessel	6.4	90.5	3.1	0	100	0
washer	10.9	88.5	0.6	0	100	0
watch	4	85.1	10.9	0	100	0

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Table 3: Distribution (%) of homonym duplication in an image by homonyms (continuation).

homonym	General			Beautification		
	nothing	one	two+	nothing	one	two+
wave	0.2	96.5	3.3	0	96	4
whiskers	16.4	82	1.6	0	100	0
window	0.2	99.6	0.2	0	100	0
wing	0.5	95.6	3.9	2	98	0

1188

1189 Table 4: Alignment between human evaluation and CLIP-based automatic evaluation. Sense
 1190 representation type in a prompt differs from those described in section 5. For CLIP-like
 1191 rankers, g_1 denotes the English sense definition, g_2 the Russian sense definition, and g_3
 1192 a short Russian translation equivalent. For each image, we obtain between two and six
 1193 CLIPScore values (depending on the number of senses of the given homonym). The Factor
 1194 column indicates which CLIPScore value is used to calculate the correlation with the results
 1195 of human evaluation (i.e., to what extent the coefficient explains and correlates with human
 1196 evaluations).

1196

1197 Model	1198 Sense represen- tation type	1199 Factor	1200 $r \uparrow$	1201 $\rho \uparrow$	1202 AUROC* \uparrow
1200 OpenAI L/14 Radford et al. (2021)	g_1	top-1	0.054	0.049	0.565
		top-2	0.159	0.166	0.722
		top-1 + top-2	0.123	0.127	0.669
		top-2 - top-1	0.101	0.103	0.638
1207 mSigLIP Zhai et al. (2023)	g_2	top-1	0.023	0.025	0.534
		top-2	0.023	0.025	0.533
		top-1 + top-2	0.024	0.026	0.535
		top-2 - top-1	0.003	0.002	0.503
1224 SigLIP2 Tschan- nen et al. (2025)	g_1	top-1	0.058	0.047	0.563
		top-2	0.192	0.202	0.769
		top-1 + top-2	0.146	0.153	0.705
		top-2 - top-1	0.126	0.128	0.670
1225 1226 1227	g_2	top-1	0.052	0.056	0.575
		top-2	0.125	0.122	0.663
		top-1 + top-2	0.098	0.097	0.629
		top-2 - top-1	0.081	0.088	0.617
1228	g_3	top-1	0.066	0.057	0.577
		top-2	0.153	0.160	0.713
		top-1 + top-2	0.126	0.126	0.668
		top-2 - top-1	0.101	0.096	0.627
1231 1232 1233	g_1	top-1	0.043	0.04	0.553
		top-2	0.184	0.183	0.744
		top-1 + top-2	0.132	0.134	0.679
		top-2 - top-1	0.119	0.119	0.658
1235 1236 1237 1238	g_2	top-1	0.061	0.055	0.573
		top-2	0.155	0.158	0.711
		top-1 + top-2	0.133	0.133	0.677
		top-2 - top-1	0.092	0.095	0.626
1239 1240 1241	g_3	top-1	0.049	0.035	0.546
		top-2	0.182	0.185	0.747
		top-1 + top-2	0.134	0.128	0.67
		top-2 - top-1	0.135	0.133	0.678

1242
1243 Table 5: Frequency of proper name occurrences. We evaluate the number of generations
1244 of different meanings across all models. It can be observed that if a homonym word has a
1245 proper name as one of its meanings, the model exhibits a pronounced bias toward generating
1246 that proper name.

Word	Translation equivalents			
stitch	cartoon character Stitch 63.6%	sewing stitch 18.0%	stitch in abdomen 0%	
bug	Volkswagen Beetle 10.9%	sledgeham- mer 0%	beetle 90.2%	
bill	Person named Bill 69.1%	payment bill 2.5%	banknote 23.3%	bird's bill 0.4%
bat	Batman 38.5%	baseball bat 0%	bat (animal) 87.3%	
jelly	Person named Jelly 0.2%	gelatine dessert 93.8%		
jack	Person named Jack OR an animal named Jack 95.63%	jack fish 0%	plug 0%	perforator 0%
mark	Person named Mark OR an animal named Mark 58.73%	mark on paper 2.18 %	trade mark 10.73%	

1278 Table 6: Distribution (%) of the number of senses per image annotated by human evaluation.
1279 Each model generated 8,550 images, ensuring that the resulting metrics are statistically
1280 reliable. Statistics for prompt expansion are reported only for the Pixart Alpha model
1281 owing to the high cost of annotation.

model	General			Prompt Expansion		
	nothing	one	two+	nothing	one	two+
Pixart Alpha	29.7	64.8	5.5	10.7	84.3	5.0
Cogview 4	25.3	71.8	2.9	-	-	-
Flux 1 dev	10.6	84.5	4.9	-	-	-
Flux 1 schell	9.9	84.1	6.0	-	-	-
Kandinsky 3	11.9	82.0	6.1	-	-	-
Pixart Sigma	25.6	70.3	4.1	-	-	-
Playground 2.5	9.1	83.9	7.0	-	-	-
SD 3 Medium	13.7	81.8	4.5	-	-	-
SD 3.5 Large	7.4	87.6	5.0	-	-	-
SD 3.5 Medium	12.3	83.0	4.7	-	-	-
SD XL	28.5	68.1	3.4	-	-	-

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1298 Table 7: Prompt expansion results for Russian prompts. The resulting HDR and WSR
1299 metrics are obtained via human evaluation.

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Russian word	English translation equivalent	W/o prompt expansion		With prompt expansion	
		WSR ↓	HDR ↓	WSR ↓	HDR ↓
финик	date (fruit)	68	20	58	0
дата	date (social meeting)	100	0	72	0
свидание	date (in the calendar)	14	20	4	0
весна	spring (season)	0	46	0	30
родник	spring (water)	54	46	0	84
пружина	spring (metal coil)	100	0	44	0
ноготь	nail (part of the finger)	0	0	34	0
гвоздь	nail (fastener)	100	0	44	0
таблица	table (chart)	100	0	100	0
стол	table (desk)	0	0	0	0
линейка	ruler (measuring tool)	30	0	14	0
правитель	ruler (leader)	98	0	4	0
почтовая	stamp (post)	8	2	36	12
марка	stamp (mark)	90	2	4	0
штамп	stamp (mark)	90	2	4	0
тростник	cane (plant)	94	0	0	0
трость	cane (walking aid)	68	0	34	2
пепел	ash (powder left after burning)	44	4	8	44
ясень	ash (tree)	90	4	2	0
мята	mint (plant)	0	0	0	0
монетный двор	mint (coin factory)	100	0	58	0
дуло	barrel (of a gun)	100	0	48	4
бочка	barrel (container)	0	0	0	0
масло	oil (for cooking)	28	6	12	0
нефть	oil (petroleum)	84	6	20	2
столица	capital (metropolis)	18	50	0	2
капитал	capital (money and possessions)	100	0	92	8
капитель	capital (part of the pillar)	36	50	18	0
джемпер	jumper (clothing)	24	76	12	0
прыгун	jumper (someone who jumps)	0	76	4	4
ромб	diamond (rhombus)	20	80	4	88
алмаз	diamond (stone)	0	80	10	20
джонка	junk (vessel)	100	0	0	0
барахло	junk (trash)	4	0	0	0
пальма	palm (tree)	0	20	0	0
ладонь	palm (part of the hand)	80	20	58	28
крикет	cricket (sport game)	78	2	16	0
сверчок	cricket (insect)	20	2	8	0