**SGG Dataset Annotation**

![SGG Dataset Annotation Image]

- **Long tailed distribution of predicates**
- **Incompleteness**
- **High Correlation**

**Predicate Knowledge on Objects**

We investigate the intrinsic correlation between objects and predicates from a new perspective. We turn our attention to the distribution of object categories under each predicate category and obtain a new statistical prior, Predicate Knowledge on Objects (PKO). Directly aggregating PKO into the inference results of SGG models can improve unbiased performance of SGG models.

\[ w_{ij} = \log \frac{\sum_{c \in C} n_{ij}^c}{\sum_{c \in C} n_{ij}} \]

\[ w_{ij} = -\log \frac{\sum_{c \in C} n_{ij}^c}{\sum_{c \in C} n_{ij}} \]

**Two Overlooked Issues and Suggestions**

**Ranking across categories may break category independence.**

The compositional diversity of different predicates varies greatly. We devised a simple experiment and observe that the predicates with limited compositional diversity have a stronger correlation with subject-object priors, which can be simply improved even without visual information.

**Assigning equal weights neglecting compositional diversity.**

We suggest independently ranking and output top-K (K = 10/20/50) predictions for each predicate category to calculate their own recall scores on this image.

**Weighted Independent Mean Recall (wIMR).** We suggest reassigning weights to each predicate category \( c \) according to the complexity of their compositional space. We count the number of composed subject-object pairs \( n_{ij} \) for each predicate category, and reassign weights to each predicate category \( c \).

\[ w_{IMR}(c) = \sum_{i,j} w_{ij} \times \text{IMR}(c) \]

**Experimental Results**

**Benchmarking SOTA Unbiased SGG Methods and PKO**

**Compared to mR@K, IMR@K provides a more fair score for those over-estimated predicate categories.**

**wIMR@K vs. mR@K/R@K.**

By considering both data distribution and compositional diversity, wIMR manages to assign high weights to predicates with rich semantics and low weights to predicates with simple semantics.