

# DEALING WITH MEANING VARIATION IN NLP

## VAGUENESS

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# SORITES PARADOX (PARADOX OF THE HEAP)

1. One grain cannot make a heap.
2. If one grain cannot make a heap, then two grains cannot make a heap.
3. If two grains cannot make a heap, then three grains cannot make a heap.

⋮

1000000. ... then a million grains cannot make a heap.

Following this line of reasoning, **no amount of grains** can form a heap.



*Bald, tall, fat, blue, large, often, good, ...*

- Vague expressions have **unclear boundaries** that result in borderline cases
- Vague concepts lead to the **sorites paradox**

**Why should NLP care?**

- Vagueness is **everywhere**
- **Accuracy** isn't everything
- **Grounding** language in vision

**NB** vagueness  $\neq$  ambiguity

# VAGUE QUANTIFIERS

*Some, several, many, lots of, few, a few, ...*

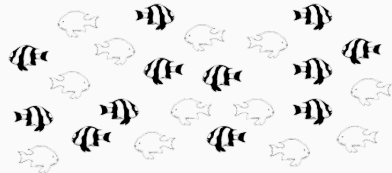
## Context-dependence

- Size of entities
- Other entities present
- Density of groups
- Perceivable differences
- ...



## Individual variation

- (Dis)likes
- Experience and expectations
- ...



(Vision-)Language models are bad at **counting**, but (maybe) that's OK.

- To what extent are vague quantifiers related to (absolute) **numbers**?
- Are V&L-models **grounded** when it comes to vagueness?
- Which **variables** are at play?

## USE IMAGES OF DIFFERENT SCENES...



... OR START MORE SIMPLE



## Zero-shot evaluation of V&L-Models

- Beyond accuracy: how to evaluate vagueness?
- Dataset creation: which variables to control?
- Human judgments: how to aggregate?

## Obstacles

- Unimodal bias
- Annotation artefacts: descriptive caption  $\neq$  good caption
- Underdetection of objects



## Stadiums and beaches

- *a few people, few people, some people, many people*
- *a few people vs. a few people on a beach, ...*
- *people on a beach vs a few people on a beach, ...*



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# EXPLORATIONS



