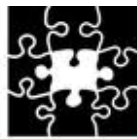# Visually Grounded, Task-oriented Dialogue
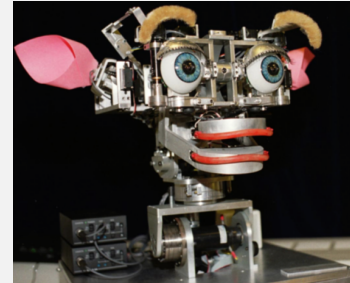
Elia Bruni

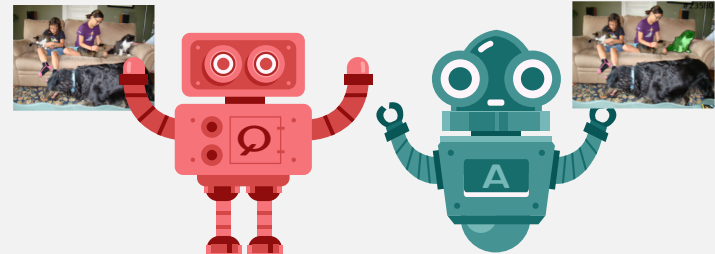INSTITUTE FOR LOGIC,
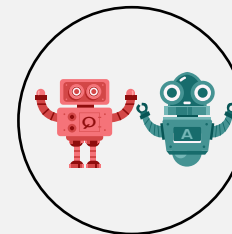LANGUAGE AND COMPUTATION

UNIVERSITY OF AMSTERDAM

Outline

Language grounding

Visual dialogue

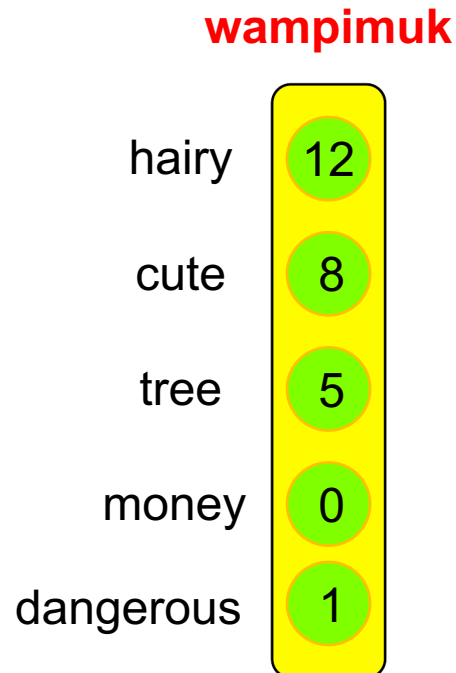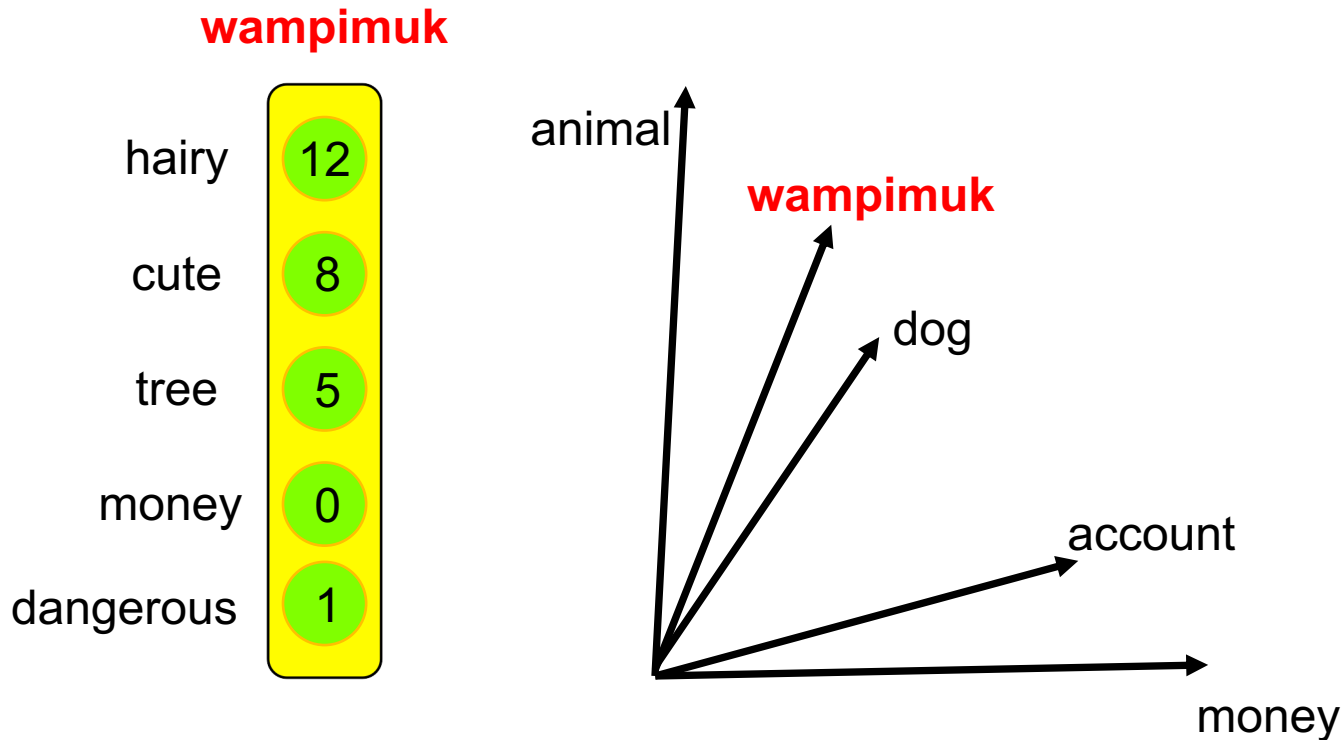Appendix: Current and future work

Distributional semantics

We found a cute, hairy **wampimuk** sleeping behind the tree

Distributional semantics

We found a cute, hairy **wampimuk** sleeping behind the tree

wampimuk

hairy	12
cute	8
tree	5
money	0
dangerous	1

Distributional semantics

We found a cute, hairy **wampimuk** sleeping behind the tree

The grounding problem

Bruni et al., Distributional Semantics in Technicolor. 2012

- **clover** is blue
- **coffee** is green
- **crows** are white
- **deers** are yellow
- **flour** is black
- **grass** is purple
- the **sky** is green
- **violins** are blue

Language grounding

Bruni et al., Multimodal Distributional Semantics. 2014
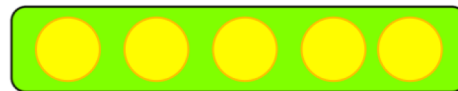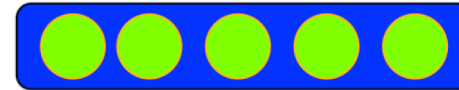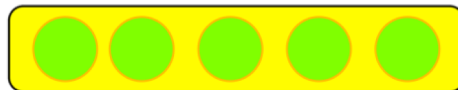
Language grounding

Bruni et al., Multimodal Distributional Semantics. 2014

Enrichment of pure textual vectors with **complementary information** coming from perceptual visual features.

Language grounding

Bruni et al., Multimodal Distributional Semantics. 2014

Enrichment of pure textual vectors with **complementary information** coming from perceptual visual features.

Language grounding
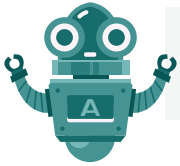
Bruni et al., Multimodal Distributional Semantics. 2014

Enrichment of pure textual vectors with **complementary information** coming from perceptual visual features.

- Word meaning not learned in isolation but from usage

Language grounding

Enrichment of pure textual vectors with **complementary information** coming from perceptual visual features.

- Word meaning not learned in isolation but from usage

- Missing the interactive and dialogical aspects of language
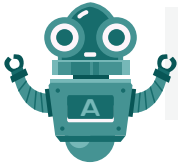
Visual Dialogue

Visual Dialogue

A man and a woman are holding umbrellas
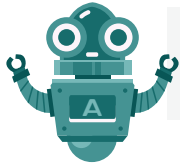
Visual Dialogue

A man and a woman are holding umbrellas

What color is his umbrella?
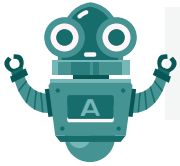
Visual Dialogue

A **man** and a woman are holding umbrellas

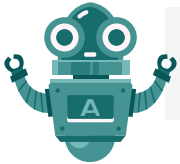What color is **his** umbrella?

Visual Dialogue
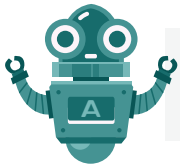

A man and a woman are holding umbrellas

What color is his **umbrella**?

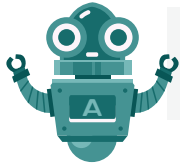# Visual Dialogue

A man and a woman are holding umbrellas

What color is his umbrella?
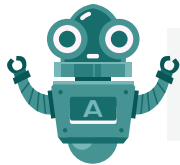
His umbrella is black

Visual Dialogue

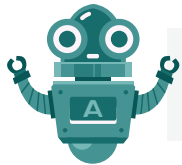A man and a woman are holding umbrellas

What color is his umbrella?

His umbrella is black

What about hers?

Visual Dialogue

A man and a **woman** are holding umbrellas

What color is his umbrella?

His umbrella is black

What about **hers**?

Visual Dialogue

A man and a woman are holding umbrellas

What color is his **umbrella**?

His **umbrella** is black

What about **hers**?