



# Computational Linguistics (INF2820 — Morphology)

{ eat, eats, eating, ate, eaten }

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# Some Areas of Descriptive Grammar

**Phonetics**      *The study of speech signals.*

**Phonology**      *The study of sound systems.*

**Morphology**      *The study of word structure.*

**Syntax**      *The study of sentence structure.*

**Semantics**      *The study of language meaning.*

**Pragmatics**      *The study of language use.*



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# Tokenization: Finding the Basic Building Blocks

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Mr. Browne, who's prime minister, arrived.

He eats chocolate, candy (i.e. sugar), etc.



# Analyzing Complex Morphology: Esperanto

- (1) La alta knabo malsaniĝis.  
'The tall boy fell ill.'
- (2) Ĉu li grandigis la grandecon de la dormejo?  
'Did he increase the size of the dormitory?'
- (3) Ankaŭ malaltaj knabinoj povas esti belaj.  
'Short girls, too, can be beautiful.'
- (4) Mia patro estas sana ĉar li ne trinkas vinon.  
'My father is healthy because he doesn't drink wine.'
- (5) La bonaj monaĥinoj volis preĝi en la preĝejo.  
'The good nuns wanted to pray in church.'

mal	san	iĝ	is	= became not healthy
not	healthy	become	past	



# Morphological Categories (1 of 3)

## Parts of Speech (PoS)

cat, dog, neighbours, ...	<b>noun (N)</b>
barks, chased, was, ...	<b>verb (V)</b>
fierce, angry, black, young, ...	<b>adjective (Adj)</b>
quickly, probably, not, ...	<b>adverb (Adv)</b>
a, the, my, that, ...	<b>determiner (D)</b>
of, by, on, at, under, ...	<b>preposition (P)</b>
she, mine, those, what, ...	<b>pronoun (Pro)</b>
and, neither ... nor, because, ...	<b>conjunction (C)</b>

How to discover the inventory of categories?



# A Quick Tour of English Morphology





# Morphological Categories (2 of 3)

## Parts of Speech (PoS)

cat, dog, neighbours, ...	noun (N)
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she, mine, those, what, ...	pronoun (Pro)
and, neither ... nor, because, ...	conjunction (C)

- **Paradigm** set of word forms, e.g. { *bark, barks, barking, barked* };
- **Unit Categories** dimensions structuring a paradigm *internally*;
- **Paradigm Categories** properties *common* to all paradigm units.



## Morphological Categories (3 of 3)

### Number — Person — Case — Gender

*That dog barks. — Those dogs bark.  
I bark. — You bark. — They bark. — Sam shaved himself.  
We bark. — You bark. — Those dogs bark.  
I saw her. — She saw me. — My dog barked.*

...

***How many distinct verb forms according to number and person?***

### Tense — Aspect — Mood

*The dog barks. — The dog barked — The dog will bark.  
The dog has barked. — The dog is barking.  
If I were a carpenter, ...*

...

