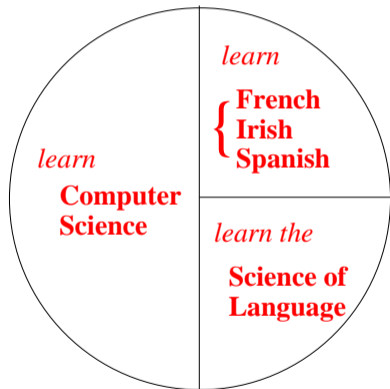




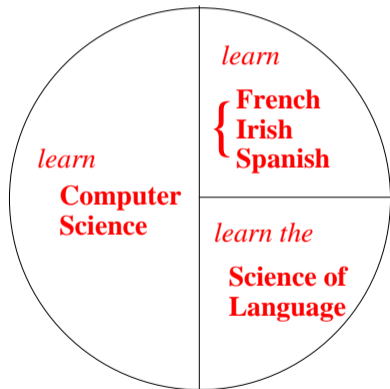
Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Computer Science, Linguistics and a Language

Dr. Martin Emms
Course Director

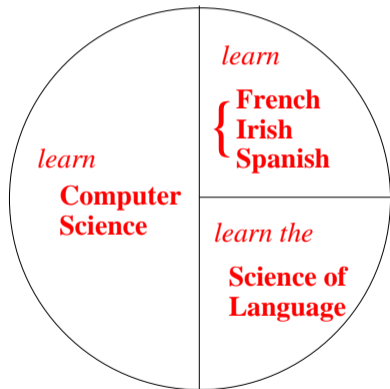


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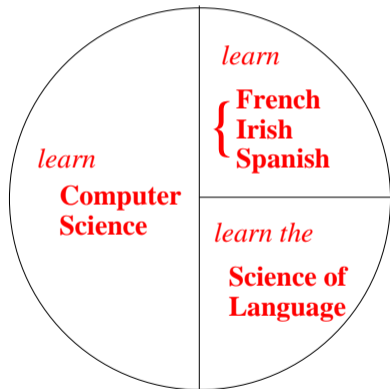
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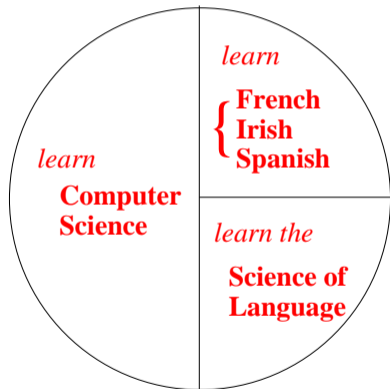
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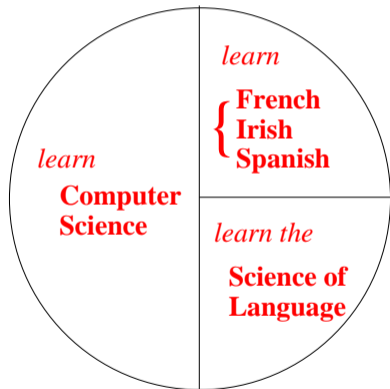
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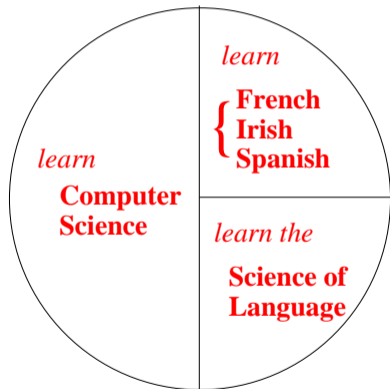
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 - { **linguistics** the scientific study of language in general
 - { **computational linguistics** the associated technologies concerning language

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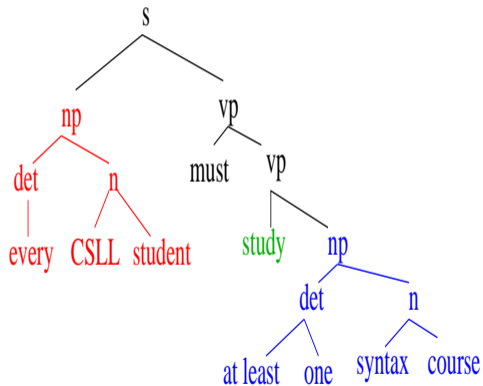
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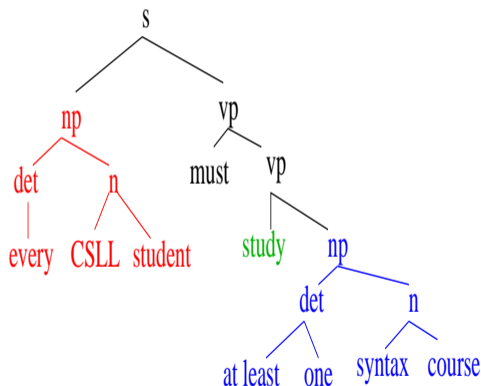
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- ▶ Language can be *scientifically studied* – this is **linguistics**



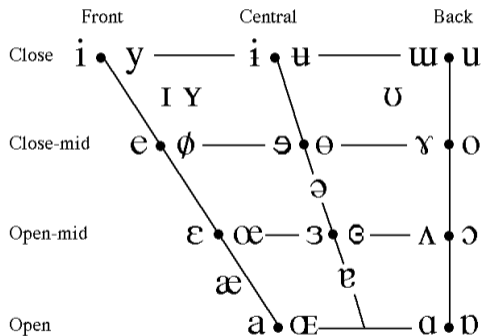
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Where symbols appear in pairs, the one to the right represents a rounded vowel.

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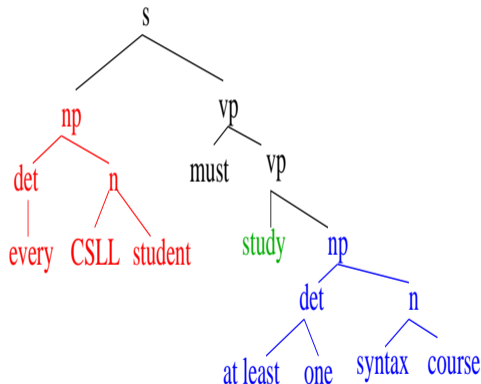
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darwin **-ian-ism** *good*

darwin **-ism-ian** *bad*

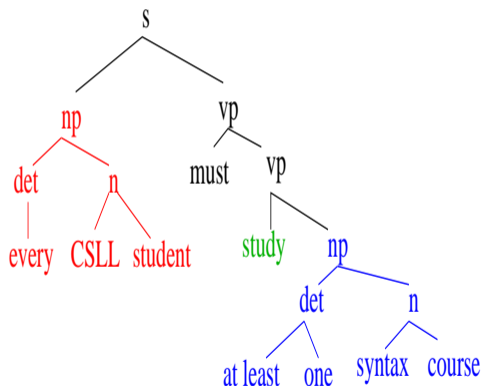
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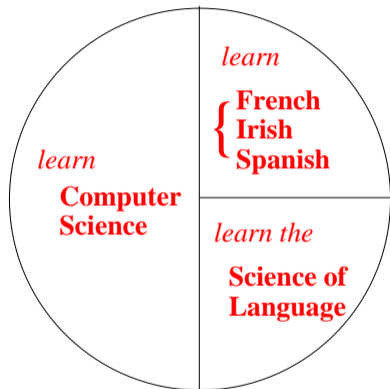
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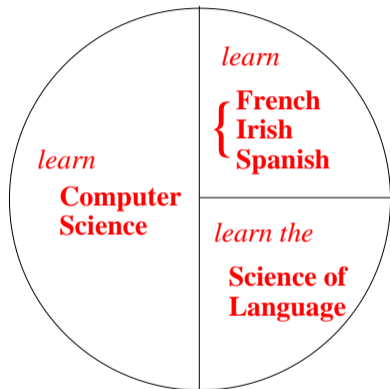
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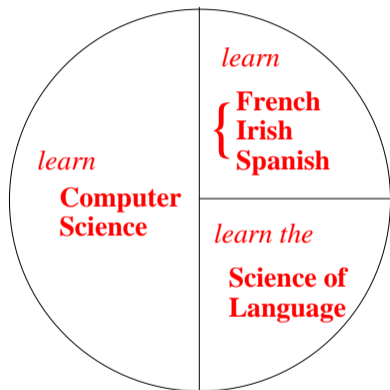
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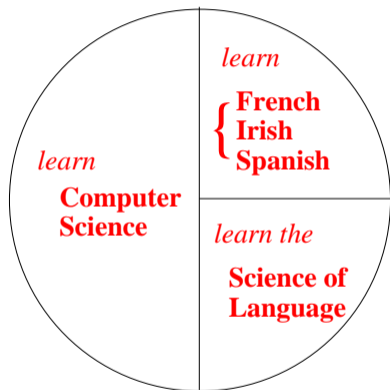
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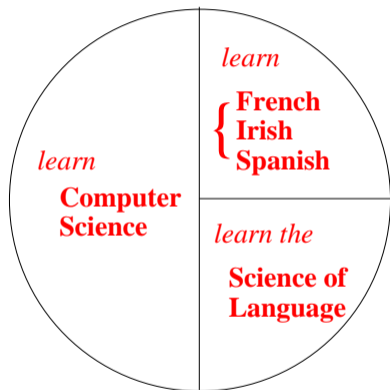
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- ▶ linguistics and computer science are joined in **computational linguistics**

What is Computational Linguistics ?

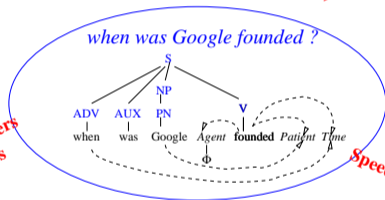
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*Finding Answers
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Translation



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Microsoft	Bill Gates	\$3.00

Speech Synthesis



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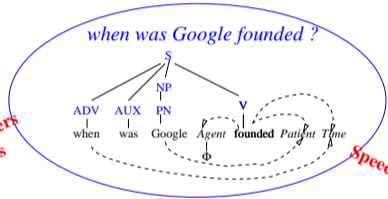
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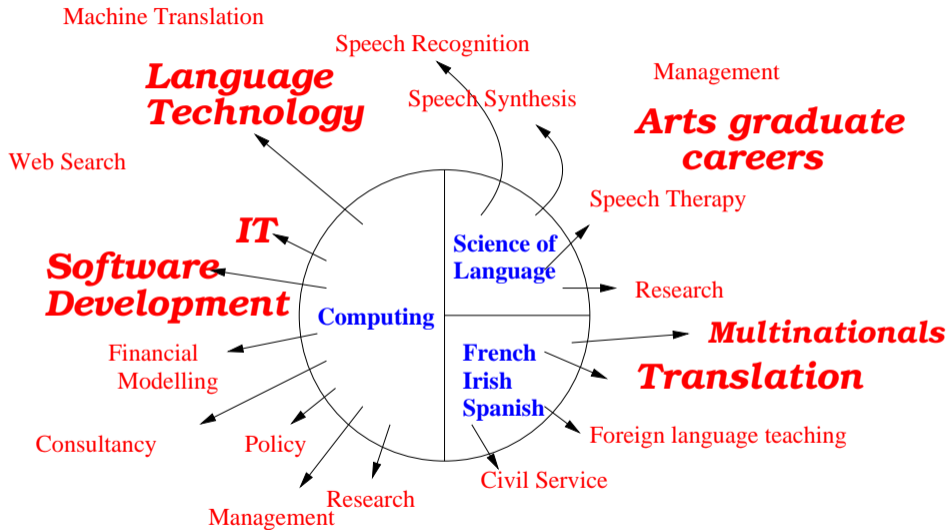
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- ▶ answering questions using texts
- ▶ machine translation
- ▶ document summarisation

- ▶ speech synthesis
- ▶ speech recognition
- ▶ language generation
- ▶ document categorisation

- ▶ speaker identification
- ▶ lie detection
- ▶ sentiment analysis

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*Problem-solving • Programming • Analysis
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CSL graduates gone into a wide range of careers, for example

- ▶ **IBM, Microsoft, Trados**
developing language technology
- ▶ **Google, Accenture**
general software engineering
- ▶ **BMW, Ingersoll Rand**
*technological and organisation roles within IT
or other sections of multinationals*
- ▶ **Deutsche Bank, DEPFA**
Banking and finance
- ▶ **Irish Diplomatic Corps**
combining language with analytical skills
- ▶ **the European Patent Office**
*combining language with technical
knowledge*
- ▶ **Transpiral**
*direct use of language skills in translation
consultancy*
- ▶ **speech and language therapy**

Year on Year

First Year

Computing

- ▶ Fundamentals
- ▶ Intro to Computer Programming (Java)
- ▶ Mathematics – logic linear algebra and calculus

Linguistics

- ▶ Language, Mind and Society
- ▶ Syntactic Analysis
- ▶ Phonetics and Phonology

Language (F/I/S)

- ▶ Fluency
- ▶ Culture

Second Year

Computing

- ▶ Data Structures and Algorithms
- ▶ C++ Programming & Computational Linguistics
- ▶ Discrete Mathematics

Linguistics

- ▶ Formal Syntax & Semantics
- ▶ Instrumental Phonetics and Speech Science
- ▶ Computational Morphology

Language (F/I/S)

- ▶ Fluency
- ▶ Translation (esp. Comp Sci area)

Year on Year

Third Year

spent as Erasmus exchange student at partner university with courses on

Computing

- ▶ A.I./Computational Linguistics
- ▶ Software Engineering
- ▶ Probability & Statistics and Formal Methods

Linguistics

- ▶ Lexicology
- ▶ Language learning

Language (F/I/S)

- ▶ Fluency
- ▶ Rhetoric

Project: applying linguistics or comp. ling to target language

Fourth Year

Computing

- ▶ Databases
- ▶ Artificial Intelligence

Linguistics

- ▶ Speech Science
- ▶ Computational Linguistics

Language (F/I/S)

- ▶ Fluency
- ▶ Translation

Option course: eg. advanced Comp. Ling.

Project: substantial research and dissertation supervised by an established researcher.

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- ▶ CSL students attend **a weekly research seminar**, *The Dublin Computational Linguistics Research Seminar*

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for further opinions and many more details see the web site

www.scss.tcd.ie/undergraduate/