



Reasoning on Natural Language

Research Internship Proposal

November 2020

Location: Télécom Paris (19 Place Marguerite Perey, 91120 Palaiseau)

Duration: 4 to 6 months

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1 Context

Today’s AI systems can extract information from natural language text. For example, given the sentence “Biden was elected the President of the US”, today’s systems can extract the fact `president(Biden, US)`. Such systems build up knowledge that finds applications in Web search, chatbots, dialog systems, or decision support.

And yet, such systems are currently incapable of extracting (let alone reasoning on) anything that goes beyond simple facts: reasons (“Biden was elected because...”), beliefs (“Trump believes that Biden was not elected”), sequences of events (Corona pandemic followed by Biden’s election), conditions (“If Trump challenges the vote, he could enforce a recount”), or falsifications (“The judge found that Trump’s accusations were wrong”). Computers are thus, in what concerns the handling of such information, still in their infancy.

This is a problem, because the handling of reasons, beliefs, and conditions would bring tremendous value for the fight against fake news, the development of more reasonable chatbots, or the understanding of societal controversies.

2 Internship Goal

The goal of the internship is to develop methods that allow the machine to extract and reason on complex information. One potential outcome of the internship is a prototype system that can take a sentence or short text as input, and answer questions on it.

The internship will take place in the frame of the NoRDF project, in which several researchers work on key questions of language understanding:

<https://suchanek.name/work/research/nordf/>

In the ideal case, the internship leads to doing a PhD in the project.

3 Skills

The candidate should have strong skills in Python or Java programming and in fields such as **machine learning**, **natural language processing**, and **logic/reasoning**.

Please be aware that this is a research internship. Its goal is not only to apply existing methods, but also to develop new ideas, algorithms, and potentially prototypes – including, but not limited to, the domain of machine learning. In this spirit, the topic of the internship can be adapted to some degree to the interests of the candidate.