Our research will make use of publicly available VQA datasets such as GQA, instances for which the system fails. We could use contrast pattern mining techniques for this possible solution is to drop this assumption and mine neuron activation patterns that identify the of the model they try to explain, i.e., they are model-agnostic. In the context of VQA systems, a start in the definition of an interpretable space for explanations of VQA systems.

Other recent approaches to signal interesting associations automatically, e.g., pointy borders in a bird may refer to its beak.

such as known objects or patterns (e.g., pointy borders, a nose, limbs, vehicles) as studied in interpretable representation for explanations that encompasses both images and texts in a VQA and feature maps in images are replaced by super-pixels (image segments) in explanations, whereas word embeddings are substituted by word occurrences. No research work until now has tried to reconcile those representations in a multimodal setting, thus the main challenge is to find a common interpretable representation for explanations that encompasses both images and texts in a VQA setting. We are particularly interested in representations that resort to semantically meaningful units such as known objects or patterns (e.g., pointy borders, a nose, limbs, vehicles) as studied in network dissection. This would allow us to yield explanations in terms of the presence or absence of those objects. Such explanations could be enhanced with semantic knowledge, such as a taxonomy, in order to signal interesting associations automatically, e.g., pointy borders in a bird may refer to its beak. Other recent approaches [Shi et al., 2019], [Yi et al., 2018] have focused on the extraction of knowledge from the input before defining a reasoning program to execute. This knowledge may be a start in the definition of an interpretable space for explanations of VQA systems.

Traditional post-hoc interpretability modules do not make any assumptions about the architecture of the model they try to explain, i.e., they are model-agnostic. In the context of VQA systems, a possible solution is to drop this assumption and mine neuron activation patterns that identify the instances for which the system fails. We could use contrast pattern mining techniques for this purpose.

Our research will make use of publicly available VQA datasets such as GQA, VQA-E, C-VQA, and CLEVR.
Skills
We are searching for motivated candidates with a PhD degree in Computer Science and with competences in machine learning (preferably with focus on deep learning). Knowledge in data mining, e.g., sequence and itemset mining, will be also appreciated.

The candidate should be proficient in written and spoken English (at least B2 level according to the CEFR system).

Benefits package
- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking (after 6 months of employment) and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

Remuneration
Gross monthly salary (before taxes): 2653 €