Application BASTRI
Fiches Equipes

MARIANNE (SR0976WR)

Modèles et données pour l'argumentation computationnelle en langage naturel WIMMICS (SR0588SR) ⧉ MARIANNE

Statut: Décision signée

Responsable : Serena Villata

Mots-clés de "A - Thèmes de recherche en Sciences du numérique - 2024" : *Aucun mot-clé.*

Mots-clés de "B - Autres sciences et domaines d'application - 2024" : *Aucun mot-clé.*

Domaine : Perception, Cognition, Interaction
Thème : Langue, parole et audio

Période : 01/02/2025 -> 31/01/2029
Dates d'évaluation :

Etablissement(s) de rattachement : UNICA, CNRS
Laboratoire(s) partenaire(s) : I3S (UMR7271)

CRI : Centre Inria d'Université Côte d'Azur
Localisation : I3S-Templiers - Sophia Antipolis
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Présentation

The MARIANNE project-team pursues high-impact research in Artificial Intelligence with a focus on data and models for computational argumentation in natural language. MARIANNE is an Inria joint project-team with the I3S (Computer Science) laboratory of Université Côte d'Azur and CNRS. The team is composed of computer scientists, but it holds a strong interdisciplinary connotation in particular with linguistics, philosophy, sociology and law. MARIANNE proposes innovative Natural Language Processing methods, addressing real-world problems, that are both theoretically sound and explainable. The team focuses on topics such as argument mining, argument and counter-argument generation, argument quality assessment, argument-based explainable AI, argument dynamics, argument-based neuro-symbolic models. The main application scenarios investigated in the team are political debates (propaganda), healthcare, law and online social media (hate speech and disinformation). The team also has a special concern about innovation and transfer. The research project of the team is aligned with the "Core elements of AI" part of the 3IA Côte d'Azur Cluster.

Axes de recherche

The MARIANNE team aims at developing NLP methods and algorithms for natural language argumentation to address the following three axes.

Axis A - Argument mining: The first research axis will be the development of models and algorithms designed for mining natural language arguments from text. The Argument Mining (AM) scientific community has focused till now on the two main tasks constituting the AM pipeline, i.e., the detection of argumentative components (namely, evidence and claims), and the prediction of the relations of support and attack holding among them. They represent an obligatory starting step, but the resulting argumentation frameworks (i.e., the graph structure composed by the arguments as the nodes of the graph and the relations representing the links) are still quite simple with respect to the needs raised in the team application scenarios. Our goal will be to enhance the extraction of machine-processable natural language argument structures to allow reasoning over complex real world natural arguments, with a focus on the English, French, Italian, Spanish and German languages.

Axis B - Natural language argument quality assessment The second research axis will be focused on the definition of computational methods to automatically assess the quality of natural language arguments. Despite a few existing approaches, the issue of automatically assessing the quality of an argumentation remains largely unexplored. On the one side, it consists in

assessing the quality of the mined arguments to decide, for instance, whether a certain argument has to be selected for synthesising a debate, or whether the overall debate is of good quality. On the other side, it consists in ensuring that the newly generated arguments satisfy the defined quality criteria in order to assess them from the qualitative point of view, i.e., a counter-argument to attack a fake news needs to be concise and without repetitions. The quality of the arguments is also characterized by formal properties of the argumentation graph, e.g., the argument strength, argument preferences, and argument acceptability.

Axis C - Generation of natural language arguments In addition to the definition of more effective methods to mine (fine-grained) argumentative structures from text, and to automatically assess their quality, the third research axis of the team will consist in the definition of new (generative and not generative) methods to generate natural language arguments, with a focus on English and French initially. This process is incremental and starts with the generation of single argumentative components towards the generation of arguments in the context of interactive dialogues with users. These dialogues are then employed in different use cases with different goals, i.e., explanation, counter-argumentation. These arguments will be firstly generated starting from the mined arguments, and they will rely on abductive reasoning schema based on the set of critical questions and reasoned responses necessary to reach the user's understanding.

Relations industrielles et internationales

The members of the MARIANNE team have numerous and strong **collaborations with national and international institutions**. Team members are also deeply involved in the scientific community through the different positions that they hold in scientific societies, agencies or journal boards.

Regarding international collaborations, we can cite, among others, those with researchers of Columbia University (USA), FBK (Italy), Imperial College London (UK), Leibniz University Hannover (Germany), Univ. Svizzera Italiana (Swiss) and EURECOM on quality assessment of natural language argumentation, with researchers of Nova Univ. of Lisbon (Portugal) and Univ. of the Basque Country (Spain) on argument-based explanations, with researchers of Univ. of Cordoba (Argentina), Univ. Torino (Italy) and Univ. Luxembourg on legal argumentation, and with researchers of Univ. of Sao Paulo (Brezil) and Universidad Nacional del Sur (Argentina) on enhancing argumentation reasoning through natural language arguments. The team (leader: Victor David) has been awareded with a new joint team, called EXPLAIN, with University College London (Prof. Tony Hunter) on the automatic processing of implicit arguments to better support argument-based reasoning in medicine.

Team members also have collaborations with local and national companies, in particular through ANR Projects. Among them, we can cite: Buster.Ai (ANR ATTENTION project coordinated by Serena Villata, counter-argumentation to fight disinformation), AFP (ANR ATTENTION), ScoolUp (detection of violent content exchanged on social networks). Team members have also strong collaborations with public institutions, and in particular: CNIL (Commission nationale de l'informatique et des libertés) on information extraction for legal documents, SGDSN (Secretariat général de la Defense et de la Securité nationale) on topic modeling on AFP news, École de l'Air et de l'Espace (ANR CIGAIA), DGFip (Direction Générale des Finances Publiques) as Serena Villata is part of their Scientific Committee.