<p style="text-align:center">**Call for applications**
Junior Professorship in Hybrid AI for Decision Making</p>

Lead institution/organisation: Inria
Name of head of institution/organisation: Bruno Sportisse
Location: Inria Côte d'Azur University Centre
Academic region: Provence Alpes Côte d'Azur

Project name: Hybrid AI for decision making
Keywords: Natural Language Processing (NLP), knowledge representation, information extraction, reasoning, explainable AI.
Duration: 3 to 6 years

Scientific theme: Natural Language Processing (NLP) and decision making

Corresponding CNU/CoNRS/CSS section(s): CNU 27, CoNRS 06 and 07

Institutional and hosting laboratory strategy
Inria has the ambition to strengthen its support to public policies, particularly those relating to the State, with defence at the forefront. Since March 2020, this commitment has been embodied in the creation of the Defence and Security Mission, a structure dedicated to meeting the State's defence and security needs. Inria's Defence and Security Mission has enabled a joint Minarm-Inria governance structure to be set up, in which the General Staff is a stakeholder alongside the DGA. In this context, a particularly important subject within Inria Defence is decision-making. Faced with an ever-increasing mass of information from the various sources available to the armed forces, it is becoming crucial to be able to capitalise on all the information extracted (text, speech, video, images, etc.) in order to make the most appropriate decision as quickly as possible and with the best possible understanding. Artificial Intelligence (AI), and more specifically Natural Language Processing (NLP) methods, enable this information to be extracted and analysed automatically. NLP has been identified by Inria and Université Côte d'Azur as a priority theme in their strategic partnership agreement signed in July 2022.

A new joint Inria-CNRS-Université Côte d'Azur project-team called MARIANNE (Models and data for computational argumentation in natural language) is being set up between the Inria centre at Université Côte d'Azur and the I3S laboratory. The main theme of this new team will be to define new NLP methods for extracting, analysing and generating argumentative content from texts in order to help human decision-making in a transparent and explainable way. This recruitment is part of the 3IA's research programme, at the crossroads of the core AI research area (where the NLP theme is included) and the application area on secure and intelligent territories, where the theme of decision support in the defence sector plays a major role.

Summary of the scientific project

Generally speaking, making a decision means choosing between several alternatives based on facts and a range of other available information. Artificial Intelligence can help with decision-making by improving data analysis and reasoning based on this data, and by being able to 'explain and justify', for a given business, the reasons that led to this decision. Decision-making touches on various areas of AI, including NLP (to automatically extract and analyse textual data), knowledge representation and reasoning (to formalise the extracted information in order to produce the best possible deliberation according to the criteria and imposed constraints).

The project, a collaboration between the future MARIANNE project-team and Inria Défense, focuses on the processing of textual information from different sources (e.g., open sources on the Web, intelligence bulletins, notes, reports of past decisions, online debates, etc.). The project's scientific objective lies at the intersection between knowledge modelling, information extraction and reasoning, in order to offer services an explicable decision-making process. It draws on different approaches in Artificial Intelligence (including generative AI and LLMs), with a focus on hybrid approaches that combine numerical models based on neural networks with formal argument-based reasoning.

Summary of the teaching project

As part of a global strategy around Artificial Intelligence, which is of interest to the whole of the Université Côte d'Azur and the 3IA Côte d'Azur, the site is aiming to strengthen its teaching activity in this field and in particular to reinforce its expertise in natural language processing and text analysis.

Teaching will take place within the EUR DS4H (Digital Systems for Humans) Computer Science Pedagogical Unit, which offers generalist Bachelor's, Master's and Doctoral courses in Computer Science. Specialised courses in AI have been developed in recent years within the Bachelor's degree in Computer Science, the Master's degree in Computer Science and the Master's degree in MIAGE (Computer Science and Management).

The person recruited will have to invest in these courses, contribute to maintaining the teaching potential in the field of AI and, if necessary, set up a new range of courses on this subject. This teaching could take place in the context of the EFELIA project at 3IA Côte d'Azur, which aims to expand the range of training courses in AI.

Expected skills
  — PhD and/or post-doc in AI and/or NLP,
  — Dynamism, autonomy / Ability to manage research projects,
  — Ability to disseminate results to the scientific community and the general public,
  — Ability to teach interdisciplinary courses,
  — Ability to supervise students (master, doctorate, post-doctorate) from a variety of various disciplinary fields,
  — Ability to organise seminars,
  — Ease of interaction with other domains,
  — Interest in applying research result to use cases,
  — Experience in defense applications is a plus.

Scientific dissemination
The expected results in terms of scientific dissemination consist of publications in the main international conferences in NLP (ACL, EMNLP, EACL, COLING, etc.) and AI (IJCAI, AAAI, ECAI, KR, etc.) and journals in the field (TACL, AIJ, Comp. Ling.). Coordination and participation in European projects in AI/NLP is also an expected result in terms of impact and scientific dissemination, with participation in the organisation of scientific events.

Open science
The project is part of an open science approach with regard to the open source publication of manually annotated textual datasets for the targeted tasks. These linguistic resources represent a vital contribution to the dissemination and reproducibility of scientific results, while aiming to preserve bias and social inequalities.

Science and society
The design of NLP methods for advanced decision making systems is a highly interdisciplinary field that is in great demand from the general public. In the long term, these solutions will be applied in advanced decision support systems, a new generation of recommendation systems that interact with humans in a more sophisticated way and that are relevant to a wide range of fields, including politics and law (to facilitate active citizenship, governance and online democracy), health and education (to verify facts, identify unjustified opinions or prejudices and develop citizens' critical thinking skills). Communication with the general public will be co-ordinated with the activities carried out on the site by the 3IA Côte d'Azur (on an annual basis, such as the Fête de la Science, World AI Cannes Festival), by Terra Numerica and by the Maison de l'Intelligence Artificielle (workshops throughout the years for schools, media libraries).

Indicators
  – Scientific publications in top-tier NLP and AI conferences and journals,
  – Participation in scientific projects at European and/or national level,
  – Organisation of scientific events on the topic,
  – Contribution to maintaining teaching potential in the field of AI,
  – Setting up a new training programme on the topic,
  – Evaluating research work in an operational context within the armed forces.

How to apply
There are no age or nationality requirements.

The following may apply: holders of a doctorate or equivalent diploma or candidates who can provide evidence of equivalent qualifications and scientific work. Inria staff is not eligible to apply.

Junior profiles with the potential to supervise and lead research, or with at least 6 years' research experience are encouraged.

Call for Applications – Junior Professorship chair

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Strategy of the Institution
Inria has the ambition to strengthen its support to public policies, in particular those relating to the State, with defence at the forefront. Since March 2020, this commitment has been embodied in the creation of the Defence and Security Mission, a structure dedicated to meeting the State's defence and security needs. Inria's Defence and Security Mission has enabled a joint Minarm-Inria governance structure to be put in place, in which the General Staff is a stakeholder alongside the DGA. In this context, a particularly important subject within Inria Defence is decision-making. Faced with an ever-increasing mass of information from the various sources available to the armed forces, it is becoming crucial to be able to capitalise on all the information extracted (text, speech, video, images, etc.) in order to make the most appropriate decision as quickly as possible and with the best possible understanding. Artificial Intelligence (AI), and more specifically Natural Language Processing (NLP), methods enable this information to be extracted and analysed automatically. NLP has been identified by Inria and Université Côte d'Azur as a priority theme in their strategic partnership agreement signed in July 2022. In addition, AI for decision support plays a central role in all of the Institut 3IA Côte d'Azur's research areas.

Host laboratory strategy
A new joint Inria-CNRS-Université Côte d'Azur project-team called MARIANNE (Models and data for computational argumentation in natural language) is being set up between the Inria centre at Université Côte d'Azur and the I3S laboratory. The main theme of this new project-team will be to define new NLP methods for extracting, analysing and generating argumentative content from texts in order to help human decision-making in a transparent and explainable way. This new team is part of the dynamic of the Inria Centre and the I3S Laboratory, in line with the objectives of the 3IA Côte d'Azur Artificial Intelligence Institute. Two permanent members of the new MARIANNE team hold a 3IA Côte d'Azur chair in the 'Core Elements of AI' area. This recruitment fits in perfectly with the 3IA's research programme, at the crossroads of the Core AI Elements axis (where the NLP theme is located) and the Secure and Intelligent Territories application axis, where the theme of decision support in the defence sector plays a major role.

Summary of the scientific project

Generally speaking, making a decision means choosing between several alternatives based on facts and a range of other available information. Artificial Intelligence can help with decision-making by improving data analysis and reasoning based on this data, and by being able to 'explain and justify', for a given business, the reasons that led to this decision. Decision-making touches on various areas of AI, including NLP (to automatically extract and analyse textual data), knowledge representation and reasoning (to formalise the extracted information in order to produce the best possible deliberation according to the criteria and imposed constraints).

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Financial summary

Total funded on the Junior Professorship (including the ANR support)	260 k€
Co-funding of the partners	50 k€ (3IA, conditional to the IA-Cluster label)
Total funding of the project	310 k€

Scientific dissemination

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