Internship Proposal – LIP6 2026

Argumentative Graph-RAG for Participatory Democracy

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Keywords: AI for Social Good · Argument Mining · Graph-RAG · Large Language Models · Civic Tech · Debate Summarization · Knowledge Graphs · NLP · Participatory Platforms · Generative AI

1. Context and Motivation

Participatory democracy platforms (Make, *Decidim*, *Cap Collectif*, *Consul*) enable thousands of citizens to propose and discuss ideas for public policies. However, the large volume of textual contributions produces severe information overload: citizens struggle to identify similar or opposing proposals, while decision-makers face difficulty in detecting consensus or disagreement.

Recent research at LIP6 has shown that Natural Language Processing (NLP) can detect argumentative relations between citizen proposals (equivalence, contradiction, neutrality). These relations can be structured into argumentative graphs, which help organize debates and improve navigation within large participatory datasets.

This internship aims to extend these ideas using Graph Retrieval-Augmented Generation (Graph-RAG). By combining graph-based retrieval with language generation, the project seeks to build intelligent tools capable of summarizing debates, identifying conflicting or redundant proposals, and assisting citizens in writing balanced contributions.

2. Goals and Tasks

The intern will contribute to the design and evaluation of a prototype system that integrates argumentative graph construction with Graph-RAG techniques. The main goals of this internship are the following:

- Build argumentative graphs from real participatory democracy datasets using NLP models.
- Extend RAG methods to exploit argumentative structures (equivalence, contradiction, refinement).
- Develop graph-based retrieval and summarization modules to enhance user navigation and debate understanding.
- Evaluate system performance using NLP metrics (coverage, diversity) and deliberative indicators (neutrality, clarity).

Planned Tasks:

- Literature review on Graph-RAG, NLP, and argument mining.
- Data preprocessing and graph construction from civic datasets.
- Implementation of NLP-based relation detection and adaptive confidence thresholds.
- Experimentation with graph traversal and context-aware summarization.
- Analysis of neutrality and diversity in generated outputs.

3. Required Skills

- **Programming:** Python, PyTorch or TensorFlow.
- **NLP / ML:** Experience with large language models, embeddings, or NLP tasks.
- **Data Science:** Text preprocessing, vector representations, evaluation metrics.
- **Research:** Ability to conduct literature reviews, design small experiments, and analyze results.
- **Participatory democracy:** Interest in participatory democracy or computational argumentation.

4. Host Teams and Environment

The internship will take place at **LIP6 – Sorbonne Université**, within two collaborating teams:

- **Database Team (Rafael Angarita):** Expertise in data management, graph modeling, and semantic relationship prediction.
- **Multiagent Systems Team (Nicolas Maudet):** Expertise in artificial intelligence and multiagent systems.

5. Practical Information

- **Duration:** 5–6 months (March–August 2026)
- **Level:** Master 2 / Final-year engineering internship
- **Allowance:** According to CNRS / Sorbonne Université internship rates
- **Keywords:** Graph-RAG, NLP, Argument Mining, Participatory Democracy, AI for Society

Contact

For questions or to apply, please contact: rafael.angarita@lip6.fr and nicolas.maudet@lip6.fr. Please include a CV, grades/transcript, and a brief note on your interest.

— *End of Internship Proposal* —