**MAJAN**

MAJAN is an extension of **AJAN** agent engineering tool to support SPARQL-BT-based **multiagent** **coordination** **into** **groups**.

MAJAN consists of **MAJAN Plugin** and **MAJAN** **Web** for [AJAN Service](https://github.com/aantakli/AJAN-service) and [AJAN Editor](https://github.com/aantakli/AJAN-editor), respectively. These extensions are integrated to AJAN and can be found in AJAN\_w\_MAJAN and AJAN\_Editor\_w\_MAJAN folders.

Moreover, MAJAN provides **postman collections** in “Postman Collections” folder to create and execute MAC use-cases easily.

Additionally, **MAJAN Web** supports **executing centrally running grouping algorithms** such as [HDBSCAN](https://dl.acm.org/doi/10.1145/2733381) to solve Clustering and [BOSS](https://ojs.aaai.org/index.php/AAAI/article/view/17879) to solve CSGP. Necessary configuration files for MAJAN Web and source code of algorithms are provided in Grouping Algorithms folder.

Furthermore, MAJAN provides template SPARQL-BTs in SPARQL-BTs-for-MAC to execute FIPA Request, CSGP and Clustering coordination protocols.

1. [**Request Protocol**](http://www.fipa.org/specs/fipa00026/SC00026H.html) enables agents to exchange some information through coordination.
2. **CSGP Protocol** enables agents to coordinate themselves into coalitions (i.e. groups) by using BOSS, which is a CSGP solver algorithm. BOSS can be replaced with other CSGP solver algorithms easily in the respective BT.
3. **Clustering Protocol** enables agents to coordinate themselves into clusters (i.e. groups) by using HDBSCAN which is a Clustering solver algorithm. HDBSCAN can be replaced with other Clustering solver algorithms easily in the respective BT.

Finally, MAJAN is provided with a guideline document which includes everything about MAJAN, starting from an overview, MAC ontology, agent communication, execution of MAC use-cases to evaluation of results. Moreover, it provides some extra tips for users which might be helpful while designing and executing a MAC use-case. Please refer to “MAJAN Guide.pdf” for more detailed information.