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Distribution model: an approach to facilitate the distribution of agent-based model

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Abstract

Agent-based modeling is a powerful tool for understanding complex systems. Some models require large amounts of agents and data. Most agent simulation platforms run models sequentially and cannot run large models in a reasonable time, or at all. To solve these problems, Agent-Based Models can use distributed computing to spread the load and/or the data over multiple computing processor. The distribution of ABM execution however raises complex issues that require advanced skills to be addressed. This paper presents the concept of distribution model that aims at simplifying the distribution of ABMs. Following the separation of concerns approach, we propose a flexible framework to separate the thematic modeling of the model from the modeling of its distribution. We describe the implementation of a model-based agent distribution model using agent to solve distribution issues. We illustrate the capacity of this approach with the GAMA platform, on how we can make it easier for modelers to efficiently distribute their models.

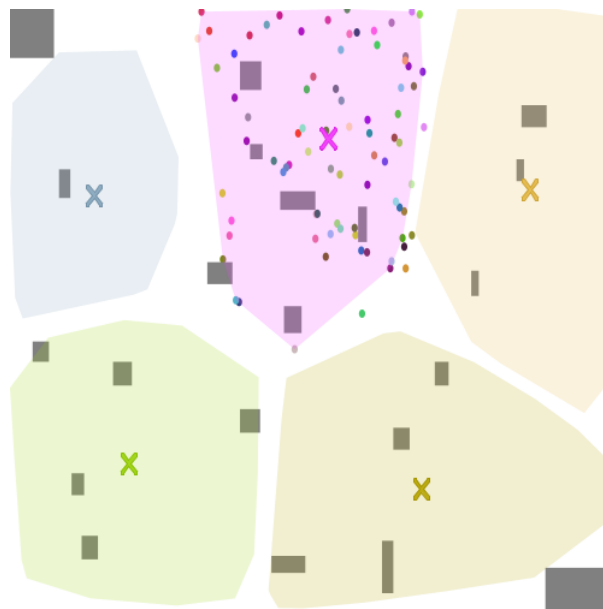


Figure 1: Distribution model implementing a KMEAN algorithm to generate partitions to distribute a GAMA evacuation model

Additional material

Github repository : <https://github.com/LucasGrjs/DistributionModel>