Adaptive Architecture Conceptual Model - Documentation

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Supplementary material for the paper "Siebers (2024) Exploring the Potential of Conversational AI Support for Agent-Based Social Simulation Model Design. https://arxiv.org/. DOI: TBA"

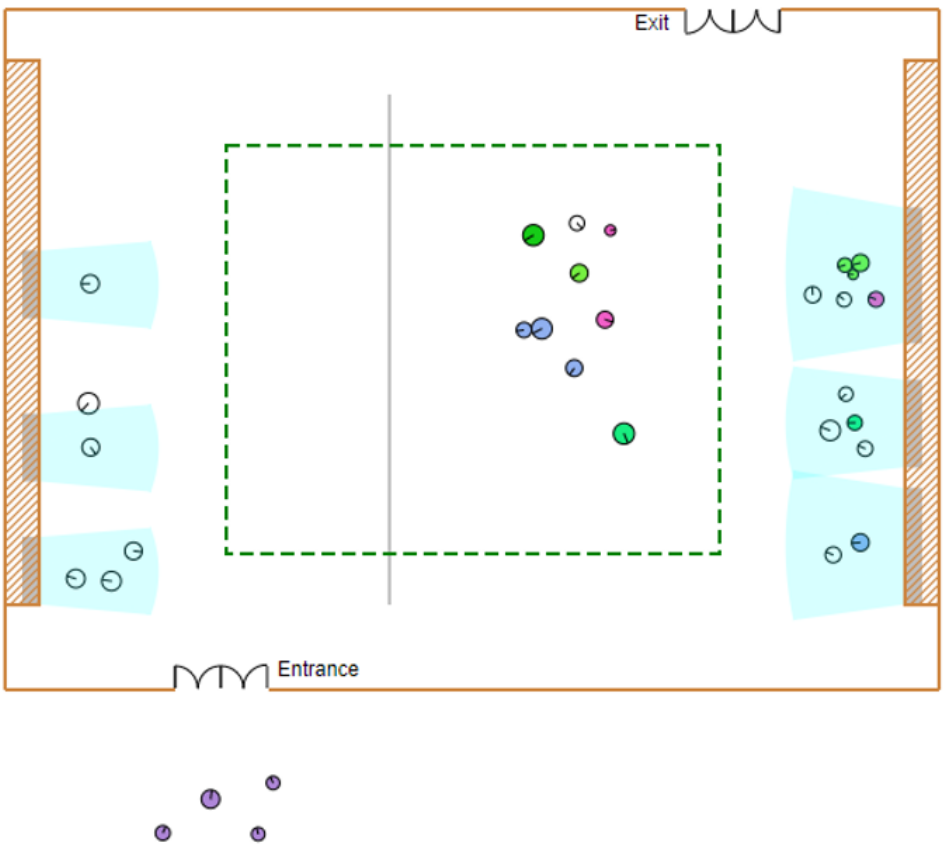
Summary

The associated paper presents a proof-of-concept that demonstrates how Conversational AI Systems such as ChatGPT can facilitate the development of innovative conceptual Agent-Based Social Simulation (ABSS) models in a concise timeframe and with minimal required upfront case-based knowledge. Through advanced prompt engineering and adhering to the Engineering ABSS framework (Siebers and Klügl 2017) we developed a comprehensive prompt script for generating conceptual ABSS models. To evaluate the usability of ChatGPT as a smart ABSS model design buddy, we employed a previously conducted illustrative case study.

The goal of the illustrative case study was to generate ideas for using adaptive architecture in a futuristic museum within an exhibition room that is visited by adults and children. The adaptive architecture we planned to integrate consisted of large wall-mounted screens on which smart content windows were moving with the visitors and a smart partition wall that creates a dynamic and flexible exhibition space by constantly analysing visitor movement and physically relocating itself. Through real-time decision making, the partition wall optimises the floor space for the visitors located in each of the sections it created.

A screenshot of the implemented model is presented in the figure on the next page. More details on the implementation can be found in Siebers et al (2018).

We used the co-created conceptual model as ground truth and generated a conceptual model with ChatGPT for comparison. The only case study relevant information provided in the ChatGPT prompt script was a description of the goal of the case study. The co-created conceptual model and the conceptual model generated by ChatGPT can be found in this repository.



References

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SIEBERS, P.O. AND KLÜGL, F. (2017). What software engineering has to offer to agent-based social simulation. In Edmonds, B. and Meyer, R. (Eds). *Simulating Social Complexity: A Handbook* - 2e. Springer.