

Drag and Drop Cognition: Graphical User Interface for Cognitive-affective Models in Multi-agent Systems

Ingo Wolf^{1,2*}, Flavio Gortana¹, Ivo Herrmann¹, Paul Thiele¹, Frank Heidmann¹, Tobias Schröder¹
¹ Potsdam University of Applied Sciences, ² Freie Universität Berlin, Germany

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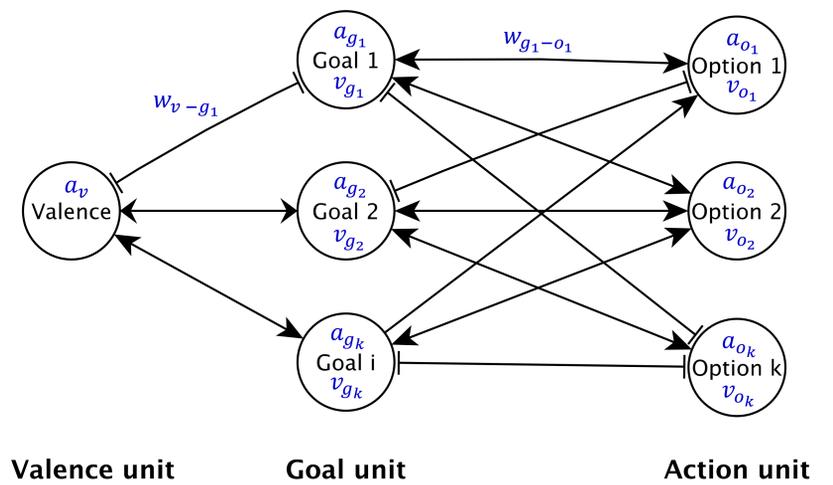
Motivation

Many agent-based model simulations have been criticized for their oversimplification and empirical inaccuracy of implemented models of human decision-making processes (e.g., Sobkowicz, 2009; Sun, 2007). Considering the inherent complexity of many cognitive architectures and neural network models, the formalization of psychologically realistic decision models remains a central challenge for agent-based modelers—in particular for researchers not trained as cognitive scientists.

In the present work, we seek to address this issue by a newly developed graphical user interface called *VisMind* enabling the user to create agent populations based on localist neural network models in a user-friendly drag-and-drop manner.

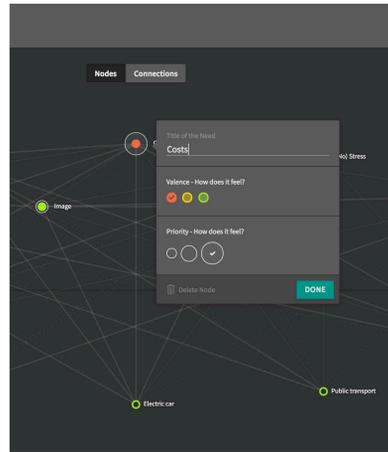
Neural network model HOTCO (for *Hot Coherence*)

Thagard, 2006

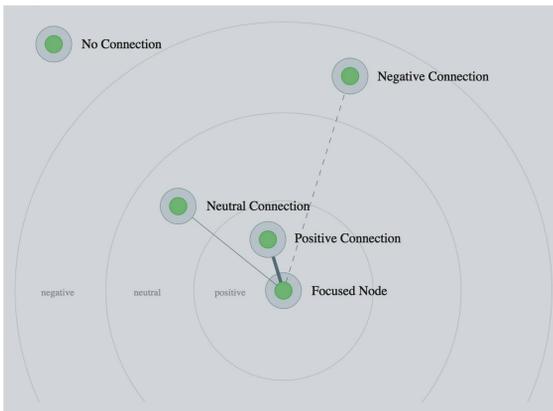


VisMind – Creating HOTCO via Webinterface

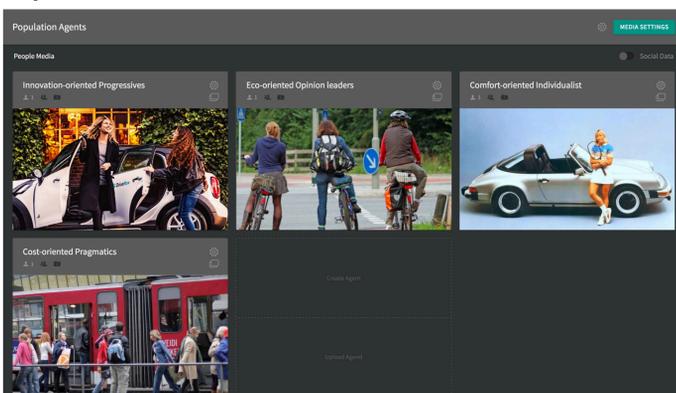
A)



B)



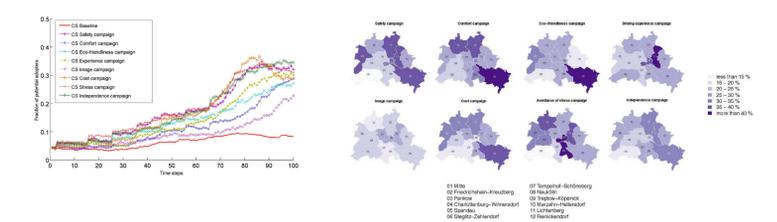
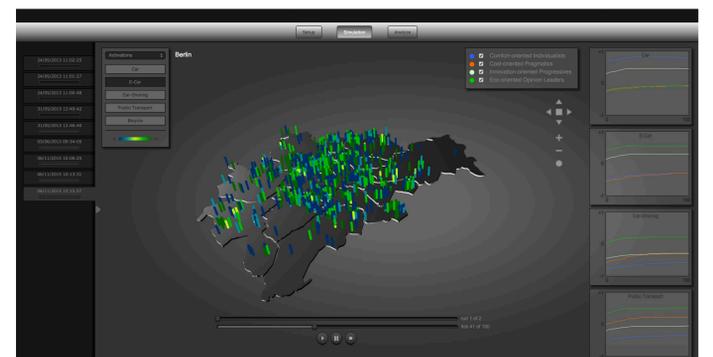
C)



- User interface to create concept nodes of the neural network and to define priorities as well as valences of nodes
- User interface to create valence weights and facilitation relations of actions and goals
- User interface to create sub-populations based on the previously defined mental representations

InnoMind – ABM of attitude change

InnoMind (for *Innovation Diffusion through Changing Minds*) was developed to study attitudinal dynamics in social systems within the context of sustainable transport (Wolf et al., 2015). The agent's cognitive architecture in this ABM is based on the above-mentioned theoretical framework and computational model of emotional cognition HOTCO, a parallel constraint satisfaction model for decision-making. Despite its specific focus and empirical grounding in the transport domain, the generic structure of *InnoMind* provides a flexible framework to adapt the psychologically plausible agent architecture to model the societal dynamics of belief systems in general.



Future work

The software is currently under development and a first component of a more complex visualization and analysis instrument of the agent-based software *InnoMind*. Continuing this line of work, we hope to further advance the accessibility to agent-based modeling, in general, and to link agent decision models closer to reality, in particular.

For further information about *VisMind* see:

<http://ivoherrmann.com/work/vismind/>

About the research project:

<http://www.ewi-psy.fu-berlin.de/einrichtungen/weitere/institut-futur/Projekte/MonForSense/index.html>

Or personal contact via e-mail: wolf@fh-potsdam.de

References

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