

## Generative Narratives for Complex Systems

*The problem:* There is good evidence that **people comprehend the world through narrative**, through stories about the world, through the agents and their behaviours and relationships. There is also good evidence that **complex systems cannot be so narrated**: current forms of story structure do not deal convincingly with the agency-less emergent properties of many complex systems. Many of the big problems facing the world today are complex systems problems: the complex system of climate change, complex ecological systems suffering extinction; complex social systems resisting improvement, and more. If these complex systems problems cannot be convincingly narrated, this implies that we literally **cannot comprehend the problems of the world**.

The long term goal of our research programme is to develop **narratives for complex systems**, in order to better understand and approach complex systems problems.

We start with simpler narratives. Narrative (story-telling) has a grammar and semantics of its own. But what distinguishes a narrative from a series of declarative statements? How do we formally distinguish the series of statements “*There is a hole. There is a corner. The hole is around the corner*” from the story “*I went round that corner yesterday. I fell into a hole. I was stuck there all day*”? How does the underlying logic constrain a cognitive grasp of systemic relations?

*The research:* The first goal of this specific PhD research is to develop a narrative grammar and semantics for inclusion in an existing robot “world understanding model”. The robot uses this internal model to run forward simulations of possible futures, in order to plan suitable actions in the world, and then updates its model based on the results of its actions. Once this model has been augmented to include narratives, the second goal is to run experiments with this system to determine precisely how the narrative component helps (or hinders!) the robot’s ability to navigate worlds of differing complexity, to analyse the narratives it develops about these worlds, and to evaluate how the narratives change with complexity.

This PhD research will be cosupervised by  
Prof Susan Stepney (Dept Computer Science; YCCSA)  
Dr Richard Walsh (Dept English and Related Literature; Centre for Narrative Studies)