

Luc Steels

University of Brussels (VUB AI Lab) and Sony
Computer Science Laboratory Paris.

Multi-Agent Models of Category Formation.

Over the past decade, our group has been attempting to build models with physically embodied agents (i.e. robots) for how perceptually grounded categories may form and become aligned in a population through situated language games. Language as well as conceptual inventories are seen as complex adaptive systems that are continuously shaped, reshaped, and negotiated as agents try to communicate. Today we have several solid experiments showing how this could work, and this talk discusses some concrete examples, specifically for categorizing and referring to individuals, colors, and bodily actions. In each of these cases, agents build up semiotic networks linking perception, categorization, language, and action. The links in these networks are weighted and the weights adapted based on the outcome of the language game. I will then discuss our current work focusing on grammar. Grammar rests also on syntactic and semantic categories (such as noun/verb, agent/patient, transitive/intransitive, etc.) that must come from somewhere, because most of them are language-specific and are changing as the language itself changes over time. It turns out that the same principles which explain the formation of perceptually grounded categories are also relevant for simulating and understanding the formation of linguistic categories.