

Alice and Bob's Adventures in Barterland

Michele Bottone
Matroid

ABSTRACT

Marketplaces are locations, physical or virtual, where two or more parties meet and interact for the purposes of exchanging something of value, and to communicate signals about concepts, ideas, goods, and services that involve information flows among diverse agents. They manage expectations based on accumulated learning and serve as ubiquitous dynamical mechanisms in society. As potentially large complex systems they are poorly understood mathematically, despite their conceptual simplicity and attractiveness for software engineering and computation [1]. Like genes and language, they can be viewed as open-ended discrete combinatorial systems (DCS) that have the capacity to generate an infinite number of combinations and permutations out of a finite number of discrete elements [2]. Meetings exhibit many of the properties of a marketplace of ideas, and an analogy can be drawn from them using the same mathematics of card shuffling. A proposal of a simple yet powerful model of a meeting is characterized as Markov recursion from a probability measure on partitions of a finite set, and defining a function on a graph dual to the lattice of partitions that handles transitions between information elements. The dynamics of a meeting can be modelled by using stochastic integration of a function modulated by partition-dependent stochastic measures [3]. This opens applications to meaning extraction in multi-agent conversations e.g. for assistive technologies for the hearing impaired using Natural Language Processing (NLP), and more generally enables improved inference engines for retrieving useful and relevant information in complex settings that go beyond mere distilled data.

BODY

Meetings as information exchange mechanisms can be featured, integrated and used as inference engines for solving problems like NLP [1, 2, 3].

REFERENCES

- [1] M. S. Miller and K. E. Drexler. Markets and computation: agoric open systems. In B. A. Huberman, editor, *The Ecology of Computation*. North Holland, 1988.
- [2] S. Pinker. *The Language Instinct*. Harper Perennial, 1994.
- [3] G. C. Rota and T. C. Wallstrom. Stochastic integrals: a combinatorial approach. *Annals of Probability*, 25(3):1257–1283, 1997.

Volume 1 of Tiny Transactions on Computer Science

This content is released under the Creative Commons Attribution-NonCommercial ShareAlike License. Permission to make digital or hard copies of all or part of this work is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page.
CC BY-NC-SA 3.0: <http://creativecommons.org/licenses/by-nc-sa/3.0/>.