Miron Kaufman

Presentation - Miron Kaufman is professor of physics at Cleveland State University. From 2000 to 2012 he chaired the Physics Department. In collaboration with the Cleveland Clinic, he has developed a professional MS program in Medical Physics that has been accredited by the Commission on Accreditation of Medical Physics Educational Programs. Dr. Kaufman's research in statistical physics covers topics in: superconductivity, magnetism, multicritical points, liquids, polymers and hierarchical and fractal lattices. Since 2007 he has been collaborating closely with Professor H. T. Diep, Université de Cergy-Pontoise, Laboratoire de Physique Théorique and Modélisation, on the statistical mechanics of solids with defects. He has collaborated on several National Science Foundation and National Institute of Health funded research projects at the interface of statistical physics with cognitive science, health science, urban studies, and engineering. Miron Kaufman holds a PhD in physics degree from Carnegie Mellon University.

Research project - Our “social physics” project applies statistical physics techniques to multi-group social conflict. It will expand to several groups the results we obtained for two groups. Individuals in each group have an attitude ranging between collaborative, very open to negotiating an agreement to inclined to protracted conflict due to extreme adherence to the group’s position. We quantify the noise as a “social temperature” T. We assume everyone interacts with everyone in time within their own group and across groups, as on an Erdös-Renyi network. The Hamiltonian H of the interactions depends on the attitude variables. We use the Boltzmann probability weight, exp(-H/T), to compute the probability distributions for attitudes. We explore by means of Monte Carlo simulations effects of the network topology on the qualitative behavior of the model. Its predictions include temporal oscillations of the attitudes towards negotiation or conflict. Monte Carlo simulations exhibit chaotic time dependence of the mean attitudes. We illustrated the model’s use with the 2016 US presidential elections and the Brexit vote. Before the outcome has materialized, the model can help a group devise or alter its strategy in response to the dynamics at work, by generating possible scenarios. Either group could ask what-if questions that can assist in selecting and altering in time a strategy that will be wise for a range of scenarios instead of just one predicted possibility. This anticipatory approach is conducive to robust decisions that can withstand more contextual challenges than decisions based on predicted futures.

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