Analytic results for Cellular Automata

Cellular Automata (CA) have been widely adopted in the biosciences as simple but powerful models of the real world. However, the analysis essential for testing scientific understanding is missing. We first review the connection that leads from differential equations to ultra-discrete equations and CA. Then we show the beginnings of the mathematical analysis needed by describing some new techniques developed for integrable CA models, including a test for integrability and analysis of the ultra-discrete linear problem analogous to isomonodromy problems.