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Computer-aided Conjecture Generation in Maths and Physics

Wednesday 17 January 2024 09:15 (45 minutes)

Proposing good conjectures is at least as valuable as proving theorems. Good conjectures capture our attention and orient our efforts, acting like guide posts on the 'mazy paths to hidden truths' (Hilbert). This talk will touch on three aspects of computer-aided conjecture generation: matching numerical values, symbolic regression and generative models. I will present a Zipf-type law for Physics equations, discuss how genetic algorithms can be used to identify new identities of Rogers-Ramanujan type and present a number of conjectural generating functions for holomorphic line bundle cohomology on certain complex projective varieties.

Presenter: CONSTANTIN, Andrei