Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **3857** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Hyperoptimization insight for computational morphogenesis

Monday 19 June 2023 12:00 (15 minutes)

The nonlinear relationship between the form and function of physical structures in our built environment raises challenges for design. Modern design methods, such as topology optimization, provide structural solutions but obscure the relationship between the form of the solution and the formulation of the underlying design problem. Here, we show that embedding computational structure design in statistical physics provides unprecedented insight into the origin and organization of design features. We show how our "hyperoptimization" approach, a generalized, superset of molecular dynamics and standard simulated annealing optimization, surmounts known design problems including grayscale ambiguity, manufacturing inaccuracy, and artificially over-specified criteria in computational morphogenesis.

Keyword-1

Design Problems

Keyword-2

Additive Manufacturing

Keyword-3

Nose-Hoover Thermostat

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Session Classification: (DAPI) M1-6 Applied Physics I | Physique appliquée I (DPAI)

Track Classification: Technical Sessions / Sessions techniques: Applied Physics and Instrumentation / Physique appliquée et de l'instrumentation (DAPI / DPAI)