Whirlwind Review of Related Topics

David Dalrymple

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Programming Buildings with Building Blocks

Easy-to-use interface to program the intelligent infrastructure
Programming Buildings with Building Blocks

Easy-to-use interface to program the intelligent infrastructure
Distributed Optimization for Optimal Energy Use

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Distributed Optimization for Optimal Energy Use

- $S_1, S_2, \ldots, S_N$ sensors
- $A_1, A_2, \ldots, A_N$ actuators
Distributed Optimization for Optimal Energy Use

- $S_1, S_2, \ldots, S_N$ sensors
- $A_1, A_2, \ldots, A_N$ actuators

$$C(s_1, \ldots, s_N, a_1, \ldots, a_M) = \sum_{k=1}^{L} \phi_k(a_k, s_k) + \sum_{i=1}^{M} u_i(s_i) + \sum_{i=1}^{N} u_i(a_i)$$
Distributed Optimization for Optimal Energy Use

$S_1, S_2, \ldots, S_N$ sensors

$A_1, A_2, \ldots, A_N$ actuators

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Cost function $\rightarrow$ Hamiltonian of a lattice gas $\rightarrow$ Statistical Mechanics

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- Cost function \( \rightarrow \) Hamiltonian of a lattice gas \( \rightarrow \) Statistical Mechanics
- The problem can be solved using LOCAL rules that only involve nearest neighbors!
Distributed Actuation for Distributed Intelligence
Distributed Actuation for Distributed Intelligence

[Diagram showing the components of distributed actuation]

- Printed Rare Earth Magnets
- Soldermask
- Steel
- Kapton
- Armature Traces
- IC
- Force (F)
Scalable Encryption for Scalable Infrastructure
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