

A network diagram background consisting of interconnected nodes and lines. The nodes are represented by circles of varying sizes and colors (blue, grey, white), and the lines are thin grey lines connecting them. The overall structure is a complex, interconnected web.

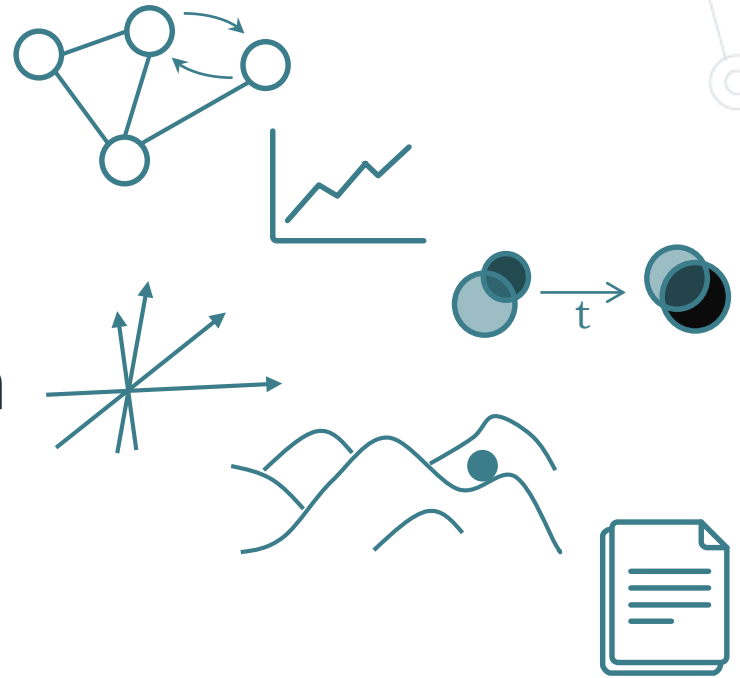
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High-performance computing in organizational science

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Current uses of HPC at Marketing & Management

- ◎ Discrete math
- ◎ Numerical analysis
- ◎ Simulation
- ◎ Parameter estimation
- ◎ Optimization
- ◎ Statistical analysis



Why use HPC?

SPEED

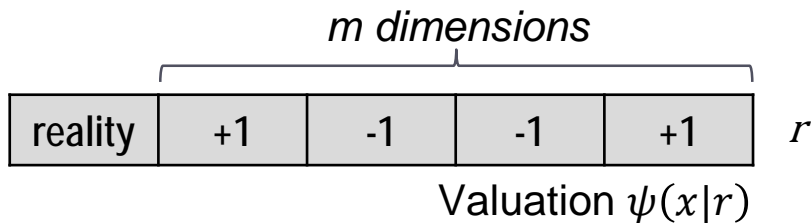
- ⦿ Larger sample sizes
- ⦿ Robustness checks
- ⦿ Results overnight
- ⦿ Fast prototyping
- ⦿ Focused effort
- ⦿ Collaboration

QUALITY



Example – Ecological learning with endogenous turnover

The March 1991 model



- Perform by experimental actions, a_i
- p1 – Socialize individual beliefs to code
- p2 – Org learns from better performers
- p3 – Turnover process (retirement)
- p4 – Turbulence, part of reality changes



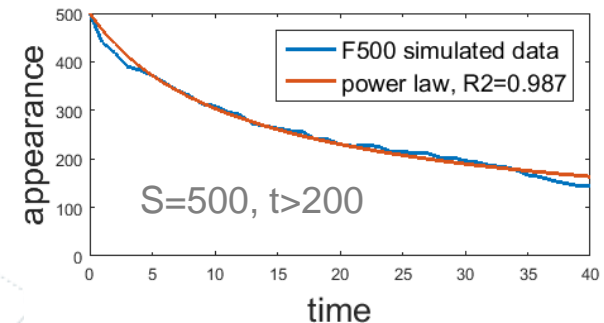
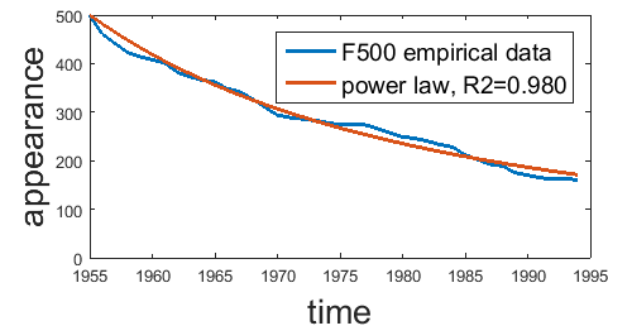
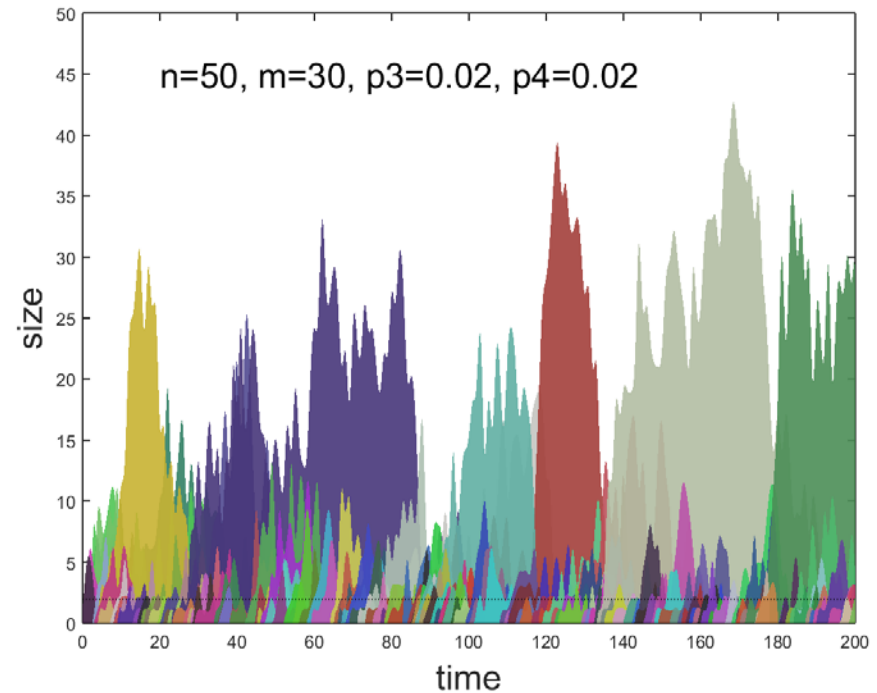
Results:

- slow learning is fast learning
- heterogeneity is better

Example – Preliminary results

- Organizations rise to greatness...
... and fall into oblivion
- Evolutionary statistics:
 - size: power law (Zipf)
 - lifetime: log-normal (Gilbrat)
- Similar to Fortune 500 appearance
- Invert the org learning lessons:
 - Fast agents are better
 - Homogeneity is better
- At the ecological level, mobility...
 - ... increases adaptation rate
 - ... increases knowledge levels

Policy-makers caring for innovation may want to revisit our definition of organizations in terms of fluid participation, transparency, and intellectual property rights.



Thank you for your attention

Inspiration:

- James G. March 1991, “Exploration and Exploitation in Organizational Learning”, Organization Science 2 (1991), 71-87
- SOD webpage: www.sod-research.com



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