


A complex network diagram with numerous nodes and edges, rendered in a light gray color against a dark gray background. The nodes are small circles, and the edges are thin lines connecting them, forming a dense, interconnected web.

NOVEMBER 11, 2014

Macroevolution of ecological networks

Timothée Poisot

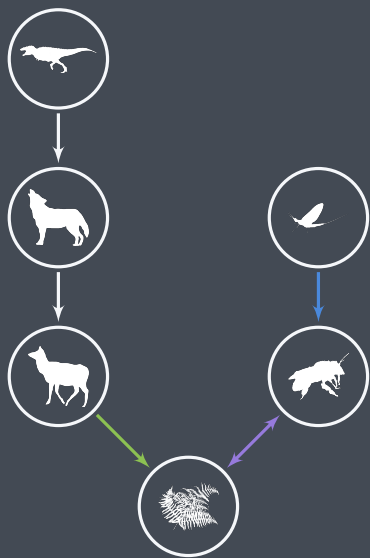
A complex network diagram with numerous nodes and connecting lines, rendered in a light gray color against a dark blue background. The nodes are small circles, and the lines are thin, creating a web-like structure that fills the entire frame.

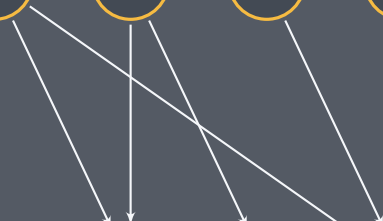
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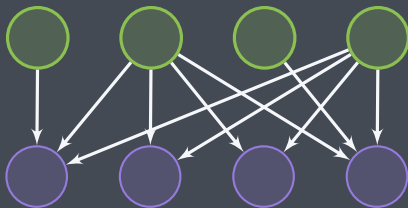
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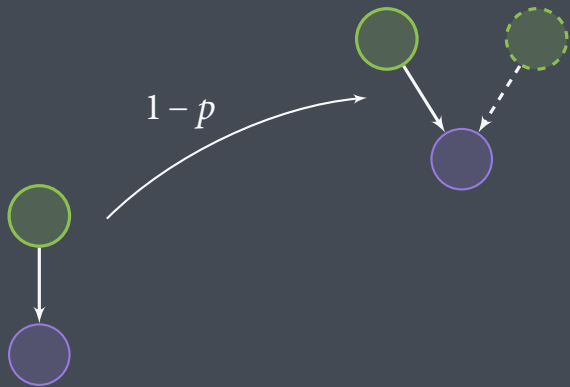


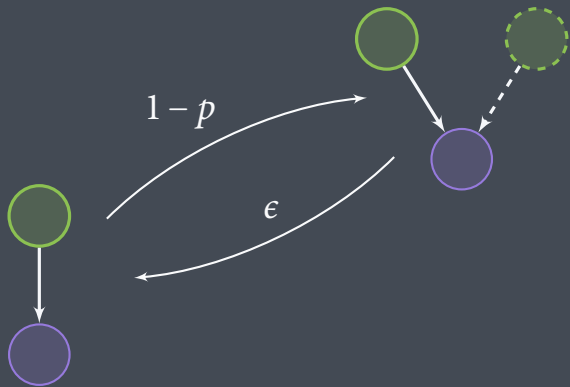


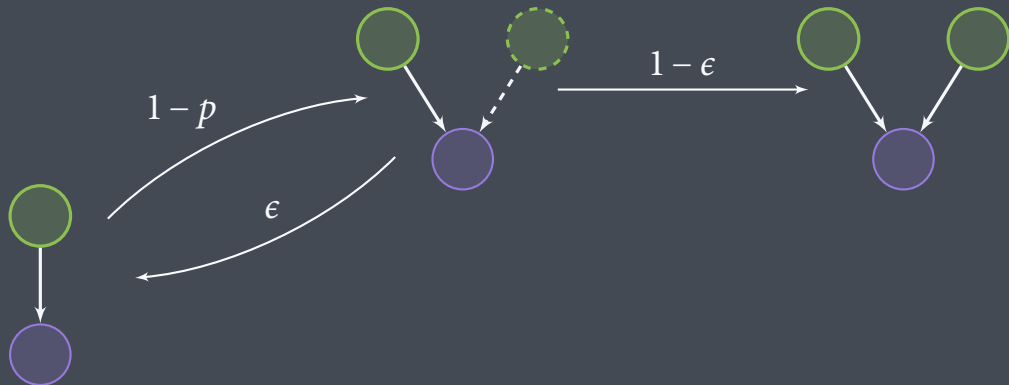


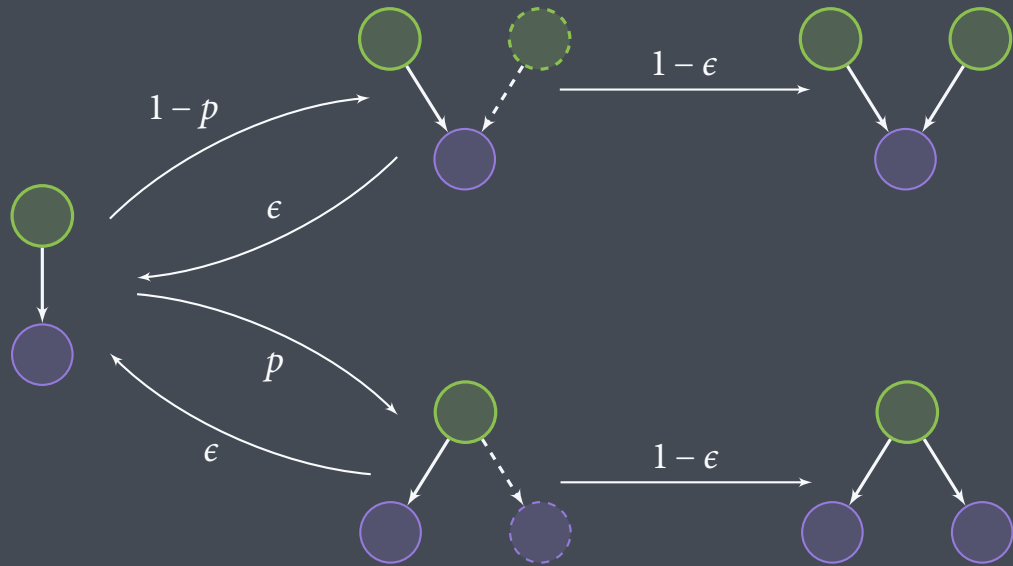
$$\frac{d}{dt}x = \frac{1}{2}\mu\sigma^2 N^*(x) \frac{\partial}{\partial x'} \omega(x', x)$$

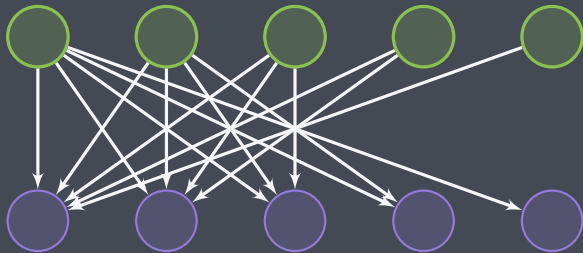


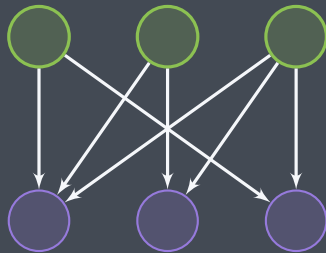
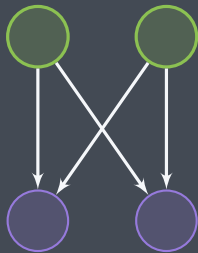


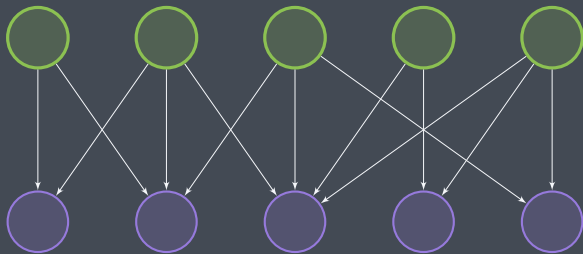


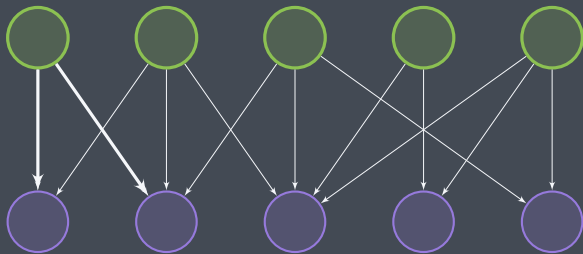


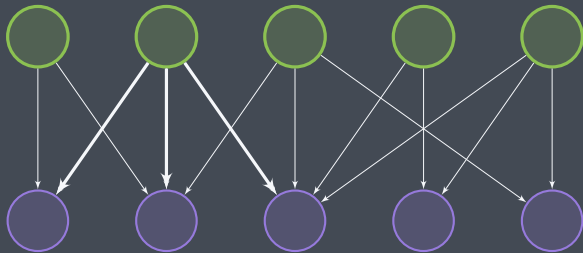


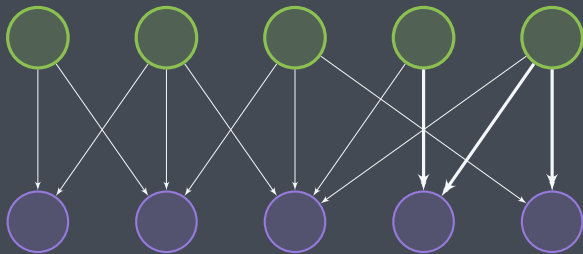


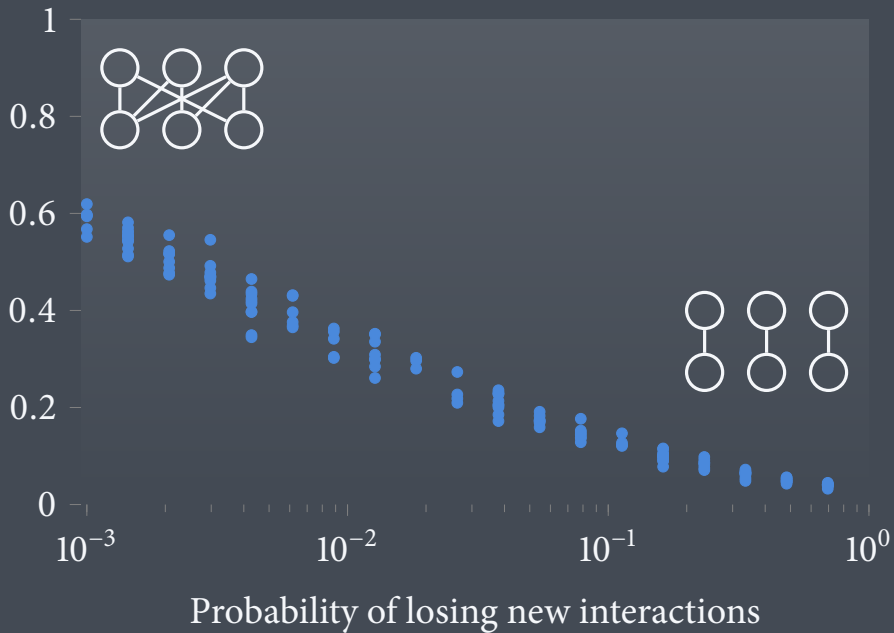


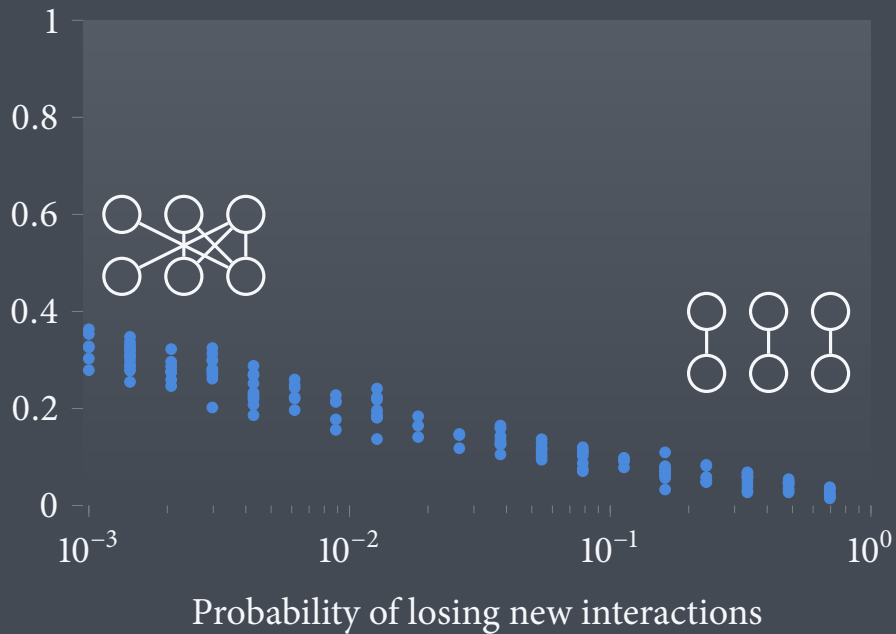


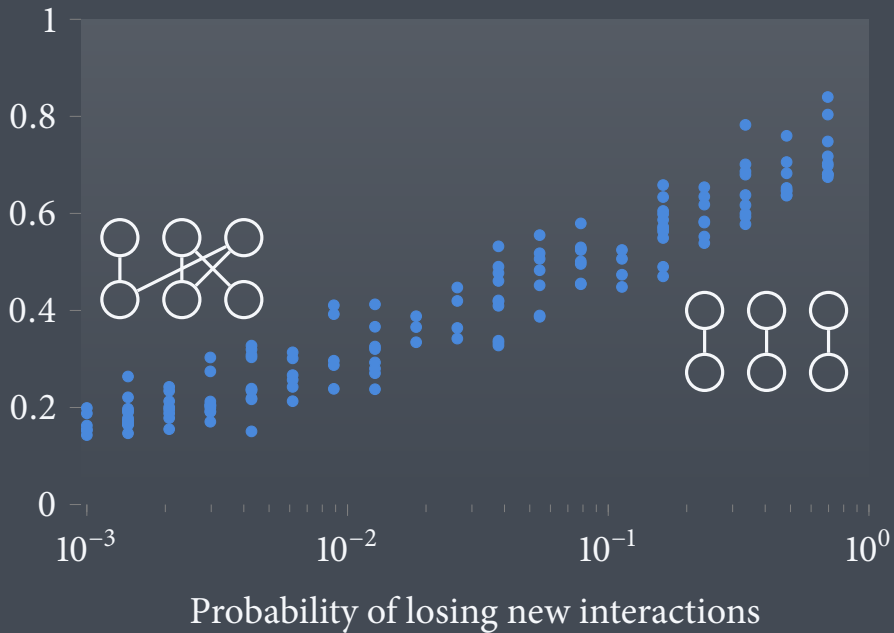












$$f(\theta) = \mathbf{S}_{\text{sim.}} \approx \mathbf{S}_{\text{obs.}}$$

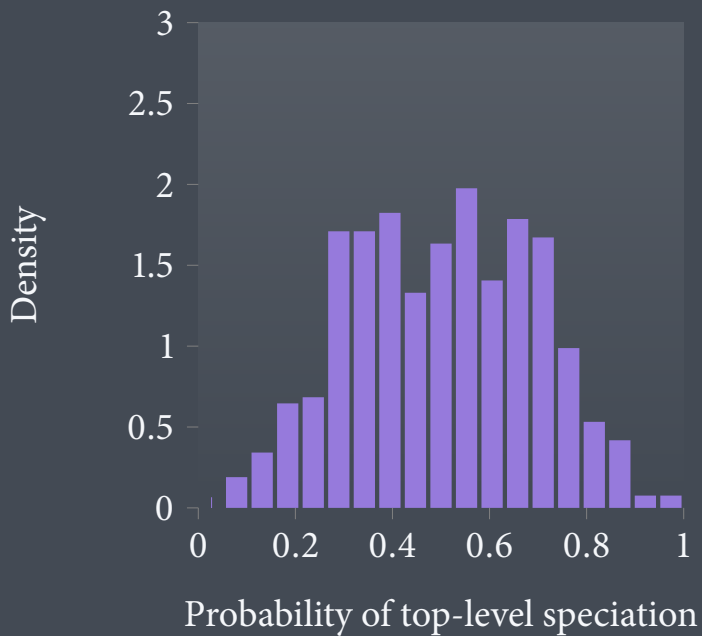
- ▶ draw parameter set θ from the prior

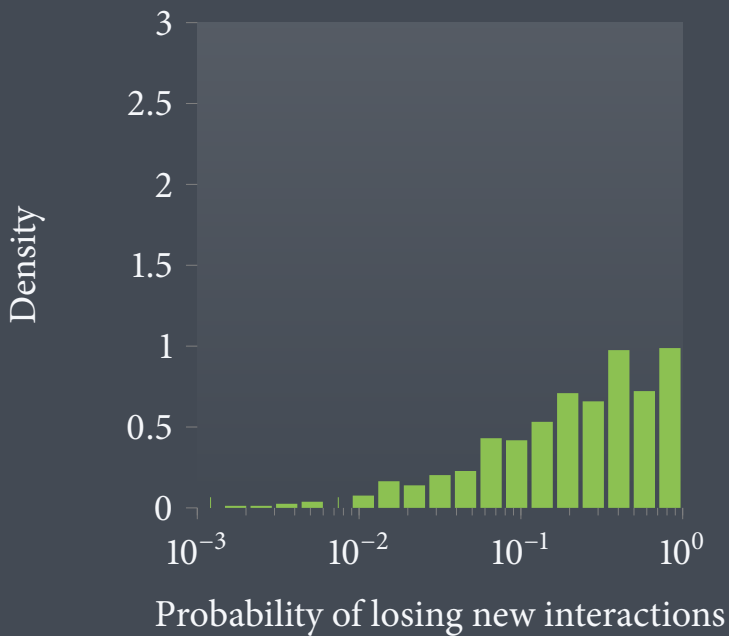
- ▶ draw parameter set θ from the prior
- ▶ simulate network

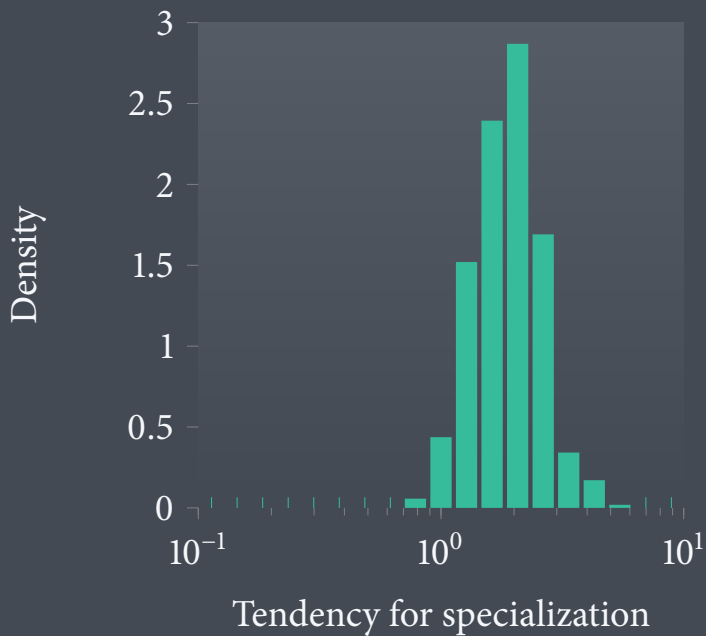
- ▶ draw parameter set θ from the prior
- ▶ simulate network
- ▶ compute $\mathbf{s}_{\text{sim.}}$

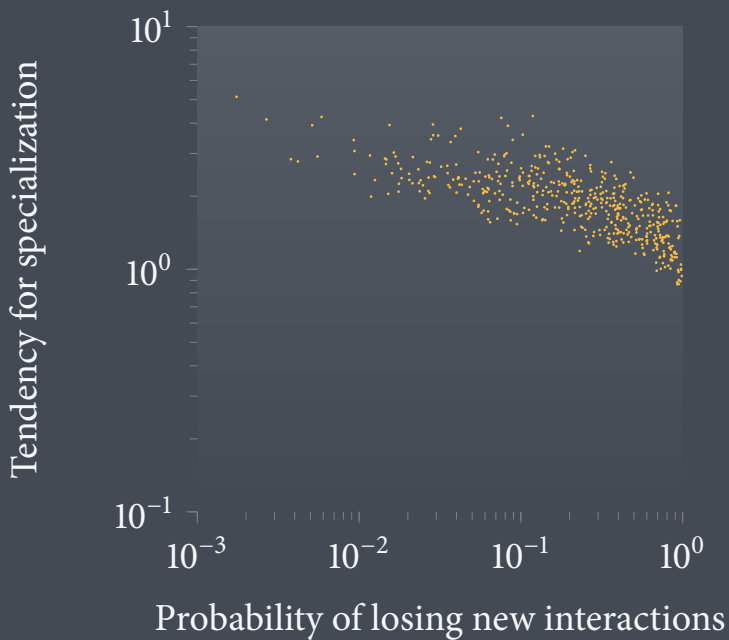
- ▶ draw parameter set θ from the **prior**
- ▶ simulate network
- ▶ compute $\mathbf{s}_{\text{sim.}}$
- ▶ measure distance d_θ between $\mathbf{s}_{\text{sim.}}$ and $\mathbf{s}_{\text{obs.}}$

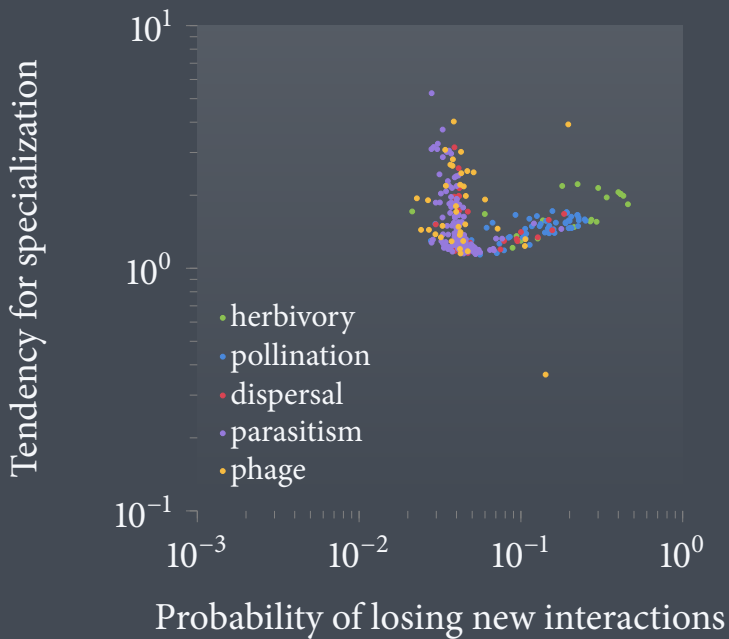
- ▶ draw parameter set θ from the **prior**
- ▶ simulate network
- ▶ compute $\mathbf{s}_{\text{sim.}}$
- ▶ measure distance d_θ between $\mathbf{s}_{\text{sim.}}$ and $\mathbf{s}_{\text{obs.}}$
- ▶ is d_θ small? Yeah, we have the **posterior**!

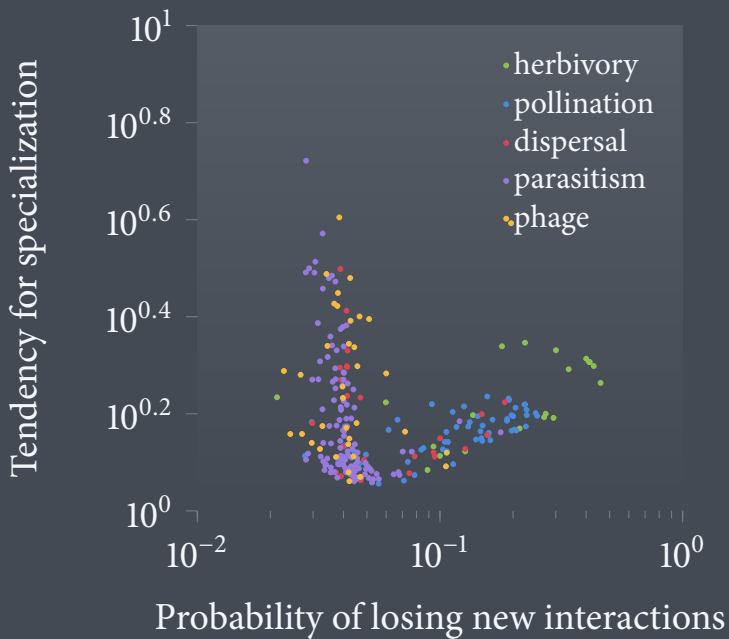


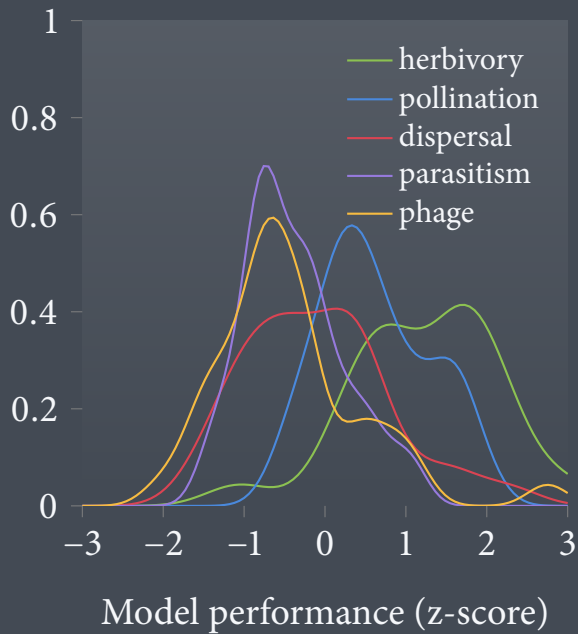














network structure is predicted by
simple evolutionary rules

types of networks differ on their
tendency to retain interactions




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