

# **(VCB)2<sup>6</sup> - Comemorando frutos de uma dinâmica complexa de orientação**

(Algumas reflexões pessoais e um obrigado.)

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# Mestrado pré-Valmir (~2005)

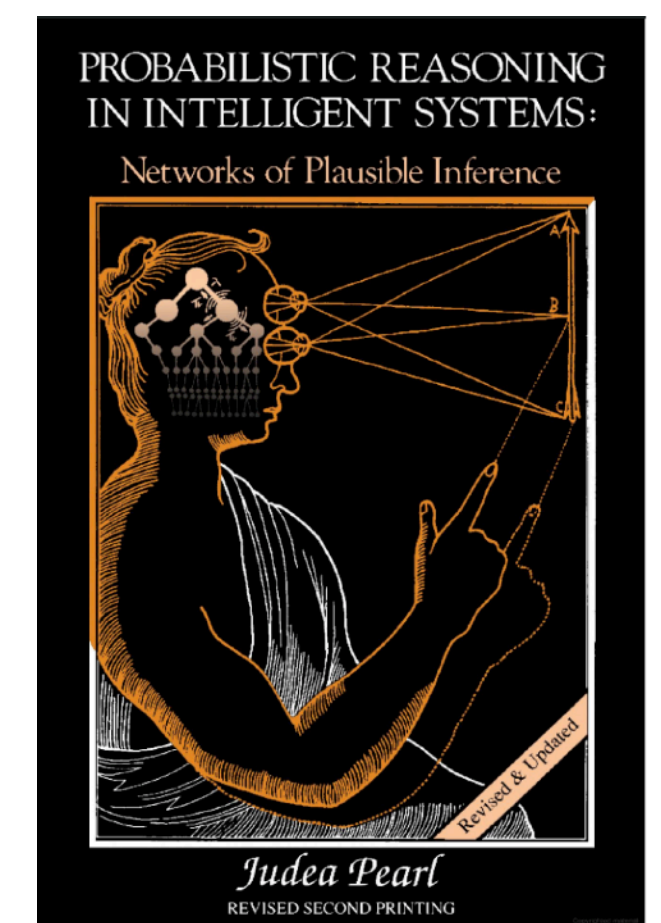
- Interesse: Teoria dos grafos, Probabilidades, AI
- Cursos
  - Dining philosophers problem (Alg. Distribuidos)
  - Hammerseley-Clifford Theorem (R. Autômato)



satisfaction problems is described in Dechter and Pearl [1987a, 1987c].

Section 4.4.3 is based on Pearl [1987a] and was motivated by Henrion [1986a].

The scheme for distributed control of concurrent simulation was adopted through discussions with Eli Gafni and Valmir Barbosa (who, during his oral examination, pointed out both the danger of concurrently activating neighboring variables and the remarkable features of the edge-reversal policy). Valmir has also pointed out that query nodes (see Figure 4.35) may remain "invisible" in the stochastic simulation process, namely, each query node may inspect its parents and compute its frequency count, but need not expose its state to its parents. The same applies to any node that is not an ancestor of an observed variable.





# Pesquisa no Mestrado

- Orientação
  - Referências
  - Transição graduação → mestrado
  - Resultados
- Aplicação para o PhD no exterior



PHYSICAL REVIEW LETTERS

## Universal Behavior of Load Distribution in Scale-Free Networks

K.-I. Goh, B. Kahng, and D. Kim

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(Received 26 June 2001; published 12 December 2001)

We study a problem of data packet transport in scale-free networks whose degree distribution follows a power law with the exponent  $\gamma$ . Load, or “betweenness centrality,” of a vertex is the accumulated total number of data packets passing through that vertex when every pair of vertices sends and receives a data packet along the shortest path connecting the pair. It is found that the load distribution follows a power law with the exponent  $\delta \approx 2.2(1)$ , insensitive to different values of  $\gamma$  in the range,  $2 < \gamma \leq 3$ , and different mean degrees, which is valid for both undirected and directed cases. Thus, we conjecture that the load exponent is a universal quantity to characterize scale-free networks.

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## Descents and nodal load in scale-free networks

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December 2007; revised manuscript received 15 February 2008; published 17 April 2008)

A node in a network is the total traffic going through it when every node pair sustains a uniform traffic between them on shortest paths. We express nodal load in terms of the more elementary node's descents in breadth-first-search [(BFS) or shortest-path] trees and study both the descent and contributions in the case of scale-free networks. Our treatment is both semianalytical (combining a recursion formalism with simulation-derived BFS branching probabilities) and computational for the verification; it is exclusively computational in the case of the load distribution. Our main result is that the load distribution, even though it can be disguised as a power law through subtle (but inappropriate) binning, is in fact a succession of sharply delineated probability peaks, each of which can be clearly identified as a function of the underlying BFS descents. This finding is in stark contrast with previously held beliefs that the load distribution, which a power law of exponent  $-2.2$  was conjectured to be valid regardless of the exponent of the power-law distribution of node degrees.



# Pesquisa e vida pós-mestrado

- Doutorado no Exterior
  - Bolsas
  - Transição mestrado → doutorado (UCLA)
  - Pesquisa em Causalidade & AI
- Professorship (Columbia University)
- Oportunidades de doutorado & pós-doutorado!
- Obrigado, Valmir!

