Probabilistic Stability in Power Grids

Literature

How dead ends undermine power grid stability.
Menck, P. J., et al.
Nature communications 5.1 (2014): 1-8.
`https://www.nature.com/articles/ncomms4969`

Survivability of deterministic dynamical systems.
Hellmann, F., et al.
Scientific reports 6.1 (2016): 1-12.
`https://www.nature.com/articles/srep29654`

Deciphering the imprint of topology on nonlinear dynamical network stability.
Nitzbon, J., et al.
New Journal of Physics 19.3 (2017): 033029.
`https://iopscience.iop.org/article/10.1088/1367-2630/aa6321/pdf`

Please also find additional literature.

Topic

In order to investigate the non-linear behaviour of complicated network dynamical systems, it is often useful to study probabilistic properties of the system. A key example is the probability that a random perturbation at a node destabilizes the network.

- Explain the key notions of probabilistic stability
- Implement an example