Reading Diary

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Contents

Chapter 1

Stability

hatziargyriou2020stability

N. Hatziargyriou, J. Milanović, C. Rahmann, V. Ajjarapu, C. Cañizares, I. Erlich, D. Hill, I. Hiskens, I. Kamwa, B. Pal, *et al.*, "Stability definitions and characterization of dynamic behavior in systems with high penetration of power electronic interfaced technologies," 2020

Write a summary of the paper...

ghanavati2016identifying

G. Ghanavati, P. D. Hines, and T. I. Lakoba, "Identifying useful statistical indicators of proximity to instability in stochastic power systems," *IEEE Transactions on Power Systems*, vol. 31, no. 2, pp. 1360–1368, 2016

Prior research has shown that autocorrelation and variance in voltage measurements tend to increase as power systems approach instability. This paper seeks to identify the conditions under which these statistical indicators provide reliable early warning of instability in power systems. First, the paper derives and validates a semi-analytical method for quickly calculating the expected variance and autocorrelation of all voltages and currents in an arbitrary power system model. Building on this approach, the paper describes the conditions under which filtering can be used to detect these signs in the presence of measurement noise. Finally, several experiments show which types of measurements are good indicators of proximity to instability for particular types of state changes. For example, increased variance in voltages can reliably indicate both proximity to a bifurcation and the location of increased stress. On the other hand, growth of autocorrelation in certain line currents is related less to a specific location of stress but, rather, is a reliable indicator of stress occurring somewhere in the system; in particular, it would be a clear indicator of approaching instability when many nodes in an area are under stress.

Chapter 2

System Strength

gu2019review

H. Gu, R. Yan, and T. Saha, "Review of system strength and inertia requirements for the national electricity market of australia," *CSEE Journal of Power and Energy Systems*, vol. 5, no. 3, pp. 295–305, 2019

Synchronous generators (SGs) are still making major contributions to the re-stabilization of a power system following voltage/frequency disturbances, attributed to their inherent capability of providing system strength and inertia. However, SGs powered by fossil fuels are operating to a lesser extent and scheduled for decommissioning in the National Electricity Market (NEM) of Australia due to the accelerating increase of low bidding priced asynchronous generation of wind and solar, which leads to the reduction and even in some cases, a shortage of system strength and inertia. This paper comprehensively reviews the requirements of system strength and inertia in the NEM from an operational security perspective. Australia is the first country that established the regulation rules of system strength and inertia to accommodate issues of an emerging high penetration level of non-synchronous renewable generation.

Chapter 3

Example Chapter

einstein1935can

A. Einstein, B. Podolsky, and N. Rosen, "Can quantum-mechanical description of physical reality be considered complete?," *Physical review*, vol. 47, no. 10, p. 777, 1935

I can write a summary of the paper here. I can write multiple paragraphs as follows.

The title of this page is the BibTeX key. The title itself is hyperlinked to the PDF of the paper. If the link does not work check the folder structure is consistent and perhaps try with a different PDF viewer (it works in Evince document viewer). When it comes time to cite this paper, I can quickly copy the BibTeX key into my LaTeX file without rummaging through the references.bib file.

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Since this a LaTeX document, it is quite easy to enter math mode to write equations, for example:

$$\sin^2\theta + \cos^2\theta = 1$$

It is also possible to have tables and even draw diagrams using TikZ.