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A Multicommodity Flow Approach to FACTS Device Control

One solution to the problem of preventing cascading failures in the electrical power system is the use of power electronics, such as Flexible AC Transmission System (FACTS) devices. In order to effectively use these devices, we must be able to calculate control settings quickly enough to mitigate a cascading failure. In this research, we abstract away the complexity of the power grid by modeling it as a directed graph, which allows us to use standard network flow algorithms to determine control settings. In particular, we investigate the use of so-called multicommodity flow algorithms, which model networks that carry more than one “type” of flow, in this case real and reactive power.

Evan Wright is a junior attending the University of Missouri-Rolla, and is pursuing a dual major in Mathematics and Computer Science.