

# Energy and Power Group

Weekly Seminar Series

Friday, November 22<sup>nd</sup>, 2019, 9:10 a.m. – 10:10 a.m., ETB 1020

## Time-Domain-Based Power System Protection, from Theory to Real-World Applications



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### Abstract

Electrical power systems have evolved from small and isolated networks to large interconnected grids with growing penetration of renewable resources. As a result, disturbances caused by faults in electrical equipment quickly propagate throughout the grid. In this scenario, protection schemes play a major role in guaranteeing fast fault clearance to avoid widespread blackouts. In the last years, the power system protection area has faced a paradigm shift with the launch of time-domain relays for ultra-high-speed transmission lines protection. Indeed, in comparison with traditional relays, the new ones can issue trip commands for circuit breakers even twenty times faster. Undoubtedly, in the next years, several innovative time-domain-based power system protection solutions will be released on the market, demanding new researches on this area. In this talk, I will present some developments on time-domain-based functions to provide reliable ultra-high-speed protection for different power apparatus, such as busbars and power transformers. Furthermore, I will discuss the most recent advances in the state-of-the-art of time-domain-based transmission lines fault location, focusing on settings-free algorithms.

### Biography

Kleber Melo e Silva received his B.Sc. in electrical engineering from University of Campina Grande (UFCG), Brazil, in 2004. He received his M.Sc. and Ph.D. degrees in electrical engineering from UFCG in 2005 and 2009, respectively. Since 2009, he is an Associate Professor at the Department of Electrical Engineering of University of Brasilia (UnB), Brazil, and the head of the Power System Protection Group. From 2016 to 2018, he was the coordinator of the Graduate Program in Electrical Engineering at UnB. He is currently an Editor of the IEEE Transactions on Power Delivery, Chair of the IEEE PES Chapter of IEEE R9 Center-North Brazilian Section and member of the scientific advisory council of the Federal District Research Foundation in Brazil. Since August 2019, he is a Visiting Scholar at Texas A&M University, College Station, TX, US. His research interests are focused on Power System Protection, Fault Location and Electromagnetic Transients. Dr. Silva is an IEEE Member, a member of SC B5 - Protection and Automation Committee of Cigré Brazil, and a Registered Professional Engineer in Federal District, Brazil.