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-Micro Phasor Measurement Unit Phasor estimation by off nominal frequency

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Abstract:

Due to the high sampling rate of the power signals by Micro Phasor Measurement Units (MPMUs) tight restrictions on computing time of different algorithms are imposed. Especially when dealing with Phasor estimation by off-nominal frequency. Sampling the power signal with a frequency which is a multiple of the instantaneous power frequency is used to fix this problem. To perform this, Gabor Transform is applied to get the update of the instantaneous frequency each cycle. In this paper we propose many time complexity enhancements to allow the Phasor estimation during the limited intersample interval, and we validate our techniques using computer simulation and real implementation on microcontroller. Using the Arm Cortex STM32F407 microcontroller with the floating point core at the maximum clock speed of 168MHz, we managed to perform all needed algorithms in about 43% of the intersample interval, and leaving the rest for data storage, display of relevant information and communication with the Data Center.

Keywords:

Smart Networks; Micro Phasor measurement units; off-Nominal frequency; Phasor estimation

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