WIND FARM MODELLING & CONTROL: MODEL ORDER REDUCTION OF WINDFARMS

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Image from: https://constructionreviewonline.com/news/kenya/chinese-firms-get-us-96m-turkana-power-line-tender/

Wind Turbine Technology has evolved over the years and it consistently plays a significant role in the goal of attaining net-zero. However, the integration of large-scale wind farms to grids are technically challenging. In order to understand and find solutions to these challenges, wind farms models are needed for grid integration studies and control. Modelling of individual components of wind turbines are non-linear and complex, resulting in high order models of wind farm which are difficult to compute and simulate. Though various techniques have been used to simplify the model of wind farms in literature, most of them are focused on linearised modelling which are limiting. My research explores new simplification techniques that can produce robust non-linear reduced order models, that is less complex, yet accurately describes the input-output behaviours of the system, and can be used for speedy assessment of power system stability, design, and control.

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