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| **Abstract:** |  |
| Wind energy plays an increasingly important role in the world because it is friendly to the environment. During the last decades, the concept of a variable-speed wind turbine has been receiving increasing attention due to the fact that it is more controllable and efficient, and has good power quality. As the demand of controllability of variable speed wind turbines increases, it is therefore important and necessary to investigate the modeling for wind turbine-generator systems that are capable of accurately simulating the behavior of each component in the wind turbine-generator systems. Therefore, this thesis will provide detailed models of a grid-connected wind turbine system equipped with a doubly-fed induction generator (DFIG). In order to control the power flowing from the rotor of the DFIG and the power network, a control law is synthesized using PI controller. The performance is compared in terms of power reference tracking. The power reference tracking was smooth and overshoot was negligible at the transient points. | |