

# Finite-Time Control for Bounded Tracking of a Variable-Speed Wind Turbine System

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## ***A. Goals***

Capturing maximum wind power in the operational mode of wind turbine system

## ***B. Brief Description***

The goals can be achieved by tracking a given reference rotor speed as mentioned in a previous research. Our work here is to design finite-time tracking controllers so that the maximum wind power can be captured.

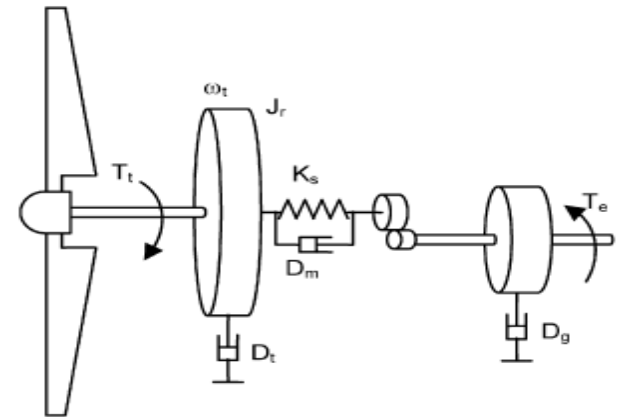
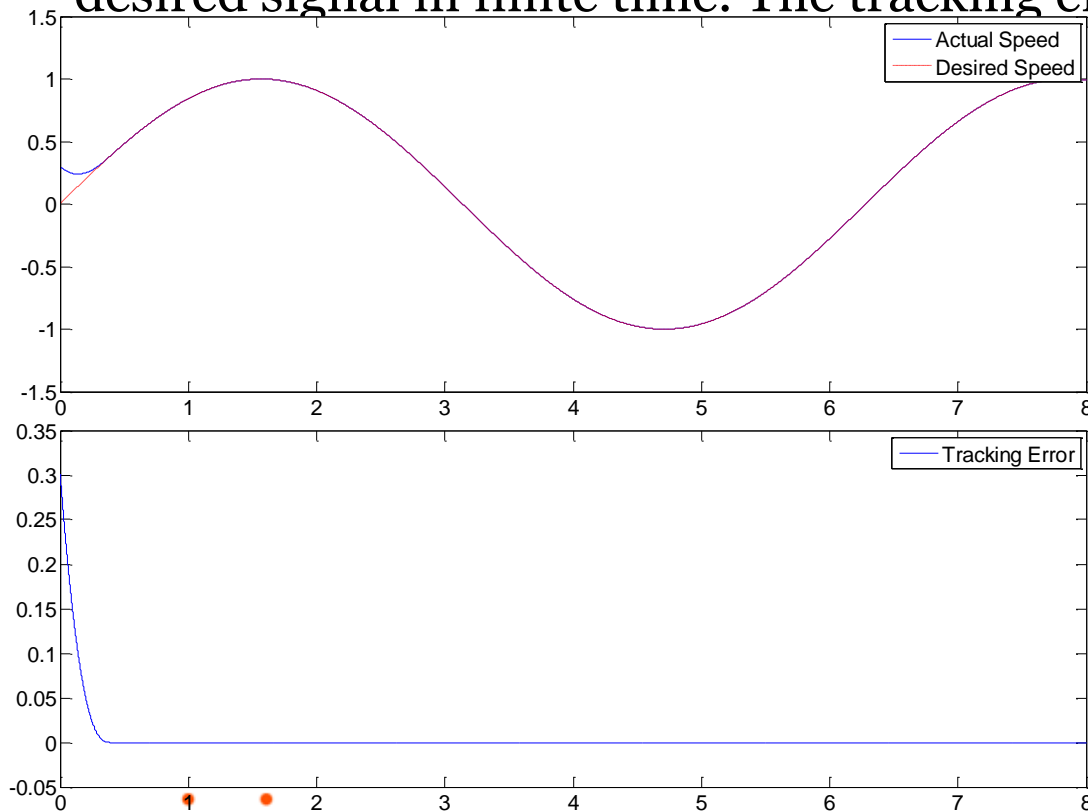
## ***C. Heights of Achievements this semester***

- Finite-time controller design for wind turbine system using traditional method
- New finite-time controller design based on the Barrier Lyapunov Functions

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The figures show the trajectory of output rotor speed which can track desired signal in finite time. The tracking error is also shown .



The new state feedback controller of the form

$$v = -\zeta_2^{2m_2-1} \left( 1 + \frac{\rho_1}{(K^2 - z_1^2)^{(m_2+1)/m_2}} + \rho_2 \right)$$