



## 主動控制小型風力發電機組

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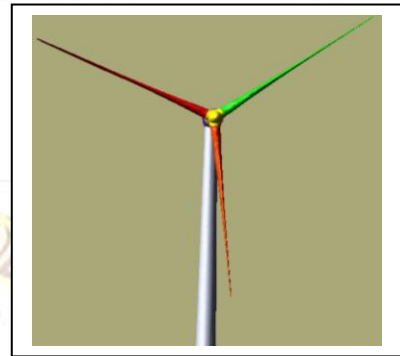
簡歷：

2012/8 迄今 兼台大嚴慶齡工業研究中心副主任

2006/07 至 2012/07 國立台灣大學工程科學及海洋工程學系 副教授

2003/08 至 2006/07 國立台灣科技大學自動化及控制研究所 副教授

2003/09 至 2007/09 國立台灣科技大學自動化及控制研究所 助理教授



### 市場及需求：

目前在國際小風機產業上，已有中國大陸、西班牙等少數 1~2 家小風機廠商開發主動或被動控制小風機以提升其效能，而台灣目前並沒有任何主動或被動控制小風機的開發，未來的競爭力嚴重不足，因此本發明著重於開發主動控制小型風力發電機，以改善其發電效能。

### 技術摘要(含成果)：

本發明針對主動控制小型風力發電機組設計及分析，以 ADAMS 動態模擬軟體建構全機組動態模擬，並結合以 FAST 發展之風機氣動力(Aerodynamic Analysis)分析以及以 MATLAB/SIMULINK 發展之次系統及閉迴路控制系統分析。並依動態模擬分析結果，發展創新主動式控制小風機系統，包含機構設計加工及組裝、伺服馬達選配、風速計及轉速計安裝、控制器軟硬體設計整合，建立創新主動式控制小風機實驗原型系統。

### 優勢：

改善小風機發電效能，在風速達到額定風速，輸出功率已經達到額定功率時，啟動變螺距角控制系統，使輸出功率不再增加，維護發電機的運轉，而不浪費在高風速時的風能。

### 競爭產品：

目前市面上一般沒有控制設計或控制性能不佳的小風機，其發電效能普遍不佳。經研究改良後，小風機能有效利用風能，達到較佳的發電效率。

### 專利現況：

(1)本專利提出之方式，目前並無。

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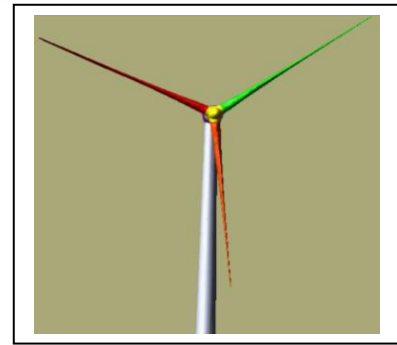


## Title of Invention

**PI :** Prof. CHIANG, Mao-Hsiung  
 Department of Engineering Science and Ocean  
 Engineering, National Taiwan University.

### Experience:

- Aug. 2012 till now, Deputy Director, NTU YEN-TJING-LING Industrial Research Institute
- July 2006- July 2012, Associate Professor, Department of Engineering Science and Ocean Engineering, National Taiwan University.



### Market Needs:

There are some industries, such as in China, Spain, developing the active control or passive control small wind turbine to improve the performance. However, there is still no active control wind turbine developed In Taiwan. This invention proposed a novel active-controlled small wind turbine for increasing the power generation performance.

### Our Technology:

The invention firstly developed the co-simulation technique to combine the mechanism dynamic simulation, aerodynamic of blades, control system dynamic simulation for analyze the small wind turbine. The novel active control wind turbine was developed, analyzed and verified by the developed the co-simulation technique. Then, the experimental prototype of the active control small wind turbine was developed, which contains a new mechanism of pitch control and new control strategies and system layout for make the small wind turbine work in the rated rotational speed steadily and capturing more wind power to generate more electric power.

### Strength:

The active control small wind turbine can work in the rated rotational speed steadily and capturing more wind power to generate more electric power.

### Competing Products:

The wind turbines in today's market are mostly without control or with passive control so that they performed poorly.

### Intellectual Properties:

Through the function of the active pitch control, the small wind turbine can perform more efficiently and can capture more wind energy.

### Contact (do not need to fill out):

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