Robust Anti-disturbance Control for the Unmanned Helicopter with Dynamic Disturbance

Mou Chen, Professor
College of Automation Engineering, Nanjing University of Aeronautics and Astronautics

Abstract
Due to the unmanned helicopter with unique characteristics such as task diversity, changeable work environment, the inherent instability, and the influence of wind and wind shear and so on, it is not easy to be efficiently controlled. On the other hand, each channel of the unmanned helicopter is severely coupled, and the external disturbance is more likely to degrade the flight quality of the unmanned helicopter, or even to crash. In this report, for the unmanned helicopter with unknown disturbance from environment and the system fault, several robust anti-disturbance flight control methods, robust flight stochastic control technique, and the robust fault-tolerant flight control scheme are introduced to guarantee the flight control performance and to improve its survival ability.

About the speaker
Mou Chen is now a professor and vice Dean of the College of Automation Engineering, Nanjing University of Aeronautics and Astronautics. He received the BSc degree and the PhD degree in Nanjing University of Aeronautics and Astronautics. He was granted by the National Science Fund for Distinguished Young Scholars in 2018, was awarded by the Millions of Talent Projects National candidates in 2019, and was elected to the Program for New Century Excellent Talents in University of Ministry of Education of China in 2011. He visited the Loughborough University, UK, from November 2007 to February 2008. He was a postdoctoral fellow in the National University of Singapore, Singapore, from June 2008 to September 2009. He was a senior research fellow in the University of Adelaide, Australia, from May 2014 to November 2014. He has actively served in the editorial boards of a number of international journals as an associate editor, including IEEE Transactions on Systems, Man, and Cybernetics: Systems, IEEE Access, Neurocomputing, International Journal of Advanced Robotic Systems, Chinese Journal of Aeronautics, SCIENCE CHINA Information Sciences, etc. He was a PI of 20 projects in the last five years, including the General Program of National Natural Science Foundation of China, and the Project for Jiangsu Natural Science Foundation of China, etc. He was awarded two Second Prize in China's State Natural Science Award (ranking second), one First Prize in Natural Science Award of Ministry of Education (ranking second), two Second Prize in National Defense Science and Technology Progress (ranking first), and applied over 20 invention patents. He has published one English monograph and one Chinese monograph. He was published over 100 academic papers, more than 100 papers were published or accepted by international journals among these papers.