

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Life Support and EVA Systems (6)

Author: Mr. zhou shihua
Astronaut Center of China, China, zhousihua2000@163.com

THE RESEARCH ON ESTIMATE MODEL OF HAND'S STRENGTH IN EVA WITH RADIAL BASIS
FUNCTION NEURAL NETWORK (RBFNN)

Abstract

TENG Peng, WANG Chun-Hui, ZHOU Shi-hua, WANG Li, XU Yong-zhong

National Key Laboratory of Science and Technology on Human Factors Engineering, Astronaut
Research and Training Center of China, Beijing, China, 100094

Key words: EVA, Hand Performance, Estimate Model, RBFNN

Objective: To develop An Estimate Model of hand's strength in EVA.

Methods: On the basis of experiment data analysis, the research of hand's strength Estimate technology has been investigated, which is about the EVA. Firstly, the hand's strength data on large sample with bare hand was selected as input vectors, correspondingly the hand's strength data with EVA glove in 40KPa was selected as output vectors, and then the Radial Basis Function Neural Network (RBFNN) of hand's strength was established. Secondly, the grip strength data with bare hand and EVA glove in 40KPa was selected to verify the precision of RBFNN's output.

Results: The strength with EVA glove in 40KPa can be estimated by RBFNN Estimate Model according to strength with bare hand, and the maximal relative error is 14.1%, average relative error is 14.1%.

Conclusion: RBFNN Estimate Model can offer good sensibility and desired results. The result will provide method and technology for human-machine interface design of EVA equipment/tool.