Movement disorders caused by nerve damage remain an intractable condition that affect a considerable number of people around the world. The population suffering from these kinds of conditions should not be underestimated in developing countries or developed countries. Rehabilitation therapy is a necessary means to treat these conditions, and need for rehabilitation detection and assessment is the foundation for rehabilitation. Although health care systems have greatly improve, but unfortunately there are still no devices that could provide a cheap, effective rehabilitation evaluation, and effective treatment system in the market.

At the moment the related medical applications of testing equipments are mostly very expensive. Several scientists research on wearable devices, but they cannot get very accurate test results because they often get only a single motion state sampling. Others make the wearing of the device very inconvenient in order to get relatively accurate evaluation result.

In this thesis, we expand research and discussion based on this fact in order to solve this urgent problem. We intended to create a wearable system that can be used for rehabilitation evaluation and assisted-treatment, which should be inexpensive and could be used in practical applications. The system performs evaluation by collecting the acceleration signal and EMG signal. This data is utilized in regression equation fitting with the established database to get the rehabilitation level. Assessment result has a significant reference value for the doctor to make the treatment plan. The thesis also research and design treatment functional module integrated with evaluation function and carry out research on the methods of the assist-treatment.

Key Words: Rehabilitation. Portable, Low-power, Acceleration. EMG, Stimulation current assist-treatment