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# Project Work, Master
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# Adaptive Treadmill for
# Gait Rehabilitation Stroke Patients

**Abstract**

Hemiplegic stroke patients suffer from a multitude of problems that make it hard to regain a normal gait. These problems include weakened leg muscles, impaired control of lower limb movements, and the fear of falling and its resulting injuries.

To assist rehabilitation of such patients, a specialized treadmill was developed to help them to exercise in order to regain muscle strength, proper control of lower limbs and confidence in normal walking. The treadmill adapts the unsteady gait of the stroke patient as he exercises. A safety harness is incorporated to catch the patient should he trip while exercising.

During the first phase of this project, various instruments were added to the treadmill to allow experimentation and to make appropriate measurements of the patient's gait on the treadmill. The gathered data was analyzed to derive suitable algorithms to detect the motion and stability of the patient.

From the data gathered, analysis was performed to derive suitable algorithms to detect patient motion and stability.

**Examiner: Prof. Dr.-Ing. Uwe Meier**