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## Inventors

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## Variable Stiffness Treadmill System

Patients with neurological conditions such as stroke often have weakness on one side of their body. This can cause the patient to walk with an abnormal gait. One leg may move more slowly than the other and the length of the stride on one side of the body may be shorter than the other side. Rehabilitation of the abnormal gait is important to the patient as it can improve their quality of life. Researchers have found that use of split belt treadmills are a successful tool that speed the patients' rehabilitation. The speeds of the different belts are adjusted to the patient's gait, and then the speed of the slow belt is slowly adjusted to a more normal gait. As the patient adapts to the more normal speed of the belt, his brain relearns how to walk normally.

Researchers at Arizona State University have developed an improvement for split belt treadmills. As we walk, our bodies react and adjust to the surface stiffness on which we are walking. By adjusting the surface condition of the belts independently, the patient's body must adjust to those conditions. Using conditions that cause the side of the body with the abnormal gait to adjust to a normal gait helps to train the brain to be able to walk with a more normal gait. This innovation allows for independent and measurable surface stiffness adjustments to be made to the treadmill.

### Potential Applications

- Rehabilitation of patients with neurological disorders
- Contributes to research for better methods of rehabilitation of patients with neurological disorders
- Training for professional athletes
- Better treadmills for personal training

### Benefits and Advantages

- Lower Costs – Speeds patients' recovery, therefore, lowering medical costs
- Better Quality of Life – Helps patients recover to a more normal lifestyle
- More Flexibility – Adaptable to the individual user's needs

For more information about the inventor(s) and their research, please see [Dr. Panagiotis Artemiadis' directory webpage](#)

