

Lecture 7: Using Robotics and functional electrical stimulation to treat tremor

Human Bionics

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Instead of using fes to make motion, we can also use it to dampen motion.

1 Pathological tremor

Tremor occurs when they do not pay attention to the hand.

- Resting Tremor occurs when the patient is resting on the table.
- Postural tremor occurs when a certain posture is requested.
- Kinetic tremor occurs when the patient is doing goal directed movements. When the patient is asked to touch his nose, he will start shaking during the movement.

There is no cure. Can use medicine but more and more is needed, so it is not very effective.

Tremor starts when there is oscillatory activity in the brain. Subcortical stimulation can prevent the tremor.

you can do invasive surgery using gamma knife which does not open the skull during surgery. Uses concentrated and focussed gamma radiation that destroys a selective part of the brain.

You can also suppress it with extra mass, so it becomes a low pass filter, by increasing the inertia of the tremor.

Dashpots (mechanical dampers) can suppress the tremor. Mechanical components also affect the voluntary motion. We need an intelligent system.