Tongue Drive System: An Alternative Control System for Quadriplegics

(Technical Report)

The Struggle for the Right to Repair in the United States

(Sociotechnical Research Paper)

An Undergraduate Thesis Portfolio
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Preface

How can engineered systems better empower their users?

How can the limited mobility of quadriplegics be improved through an accessible system? The tongue drive system is a wearable assistive device that will help individuals with spinal cord injuries or any neuromuscular diseases, also known as quadriplegics, better navigate the world by allowing them to use their tongue to control an electric wheelchair. This head-worn device is equipped with magnetic field sensors to track the fluctuation of the magnetic field due to a magnet attached to the user's tongue. Using the data from the sensors, an MSP432 microcontroller performs some data processing to determine the tongue's position and transform that into control data that can be outputted to a wheelchair. This device is designed to be easy and intuitive to operate with as little outside assistance as necessary.

In the US, what interests, ideas and values do critics and proponents of the Right to Repair Movement invoke in defense of their respective agendas? Proponents of the movement include small shop owners, nationwide interest groups, and local and online repair communities. Critics of this movement include manufacturers and technology trade groups. Proponents and critics of the right to repair movement are divided over questions of consumer rights, repair costs, environmental implications, safety and intellectual property.