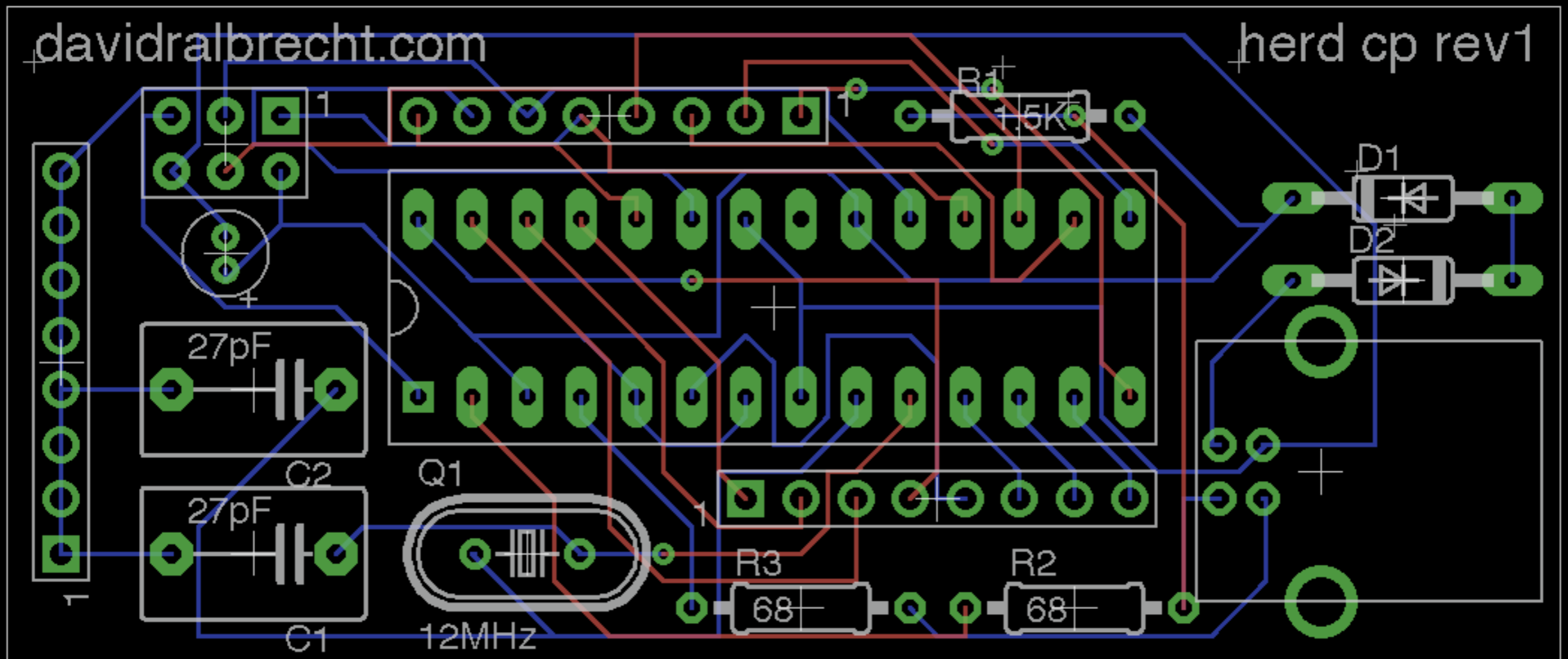


Atoms > Bits



David R. Albrecht
Ignite Seattle 9

What is cerebral palsy?

More than half a million Americans suffer from cerebral palsy.

Tomorrow's economics will succeed where yesterday's failed.

I'm David Albrecht, and I'm a hardware hacker.

“I challenge a team of you to design a computing device that enables people with mild to moderate cerebral palsy to contribute to society in meaningful and productive ways.”



About us

Welcome to The Spastics Centre Kanpur



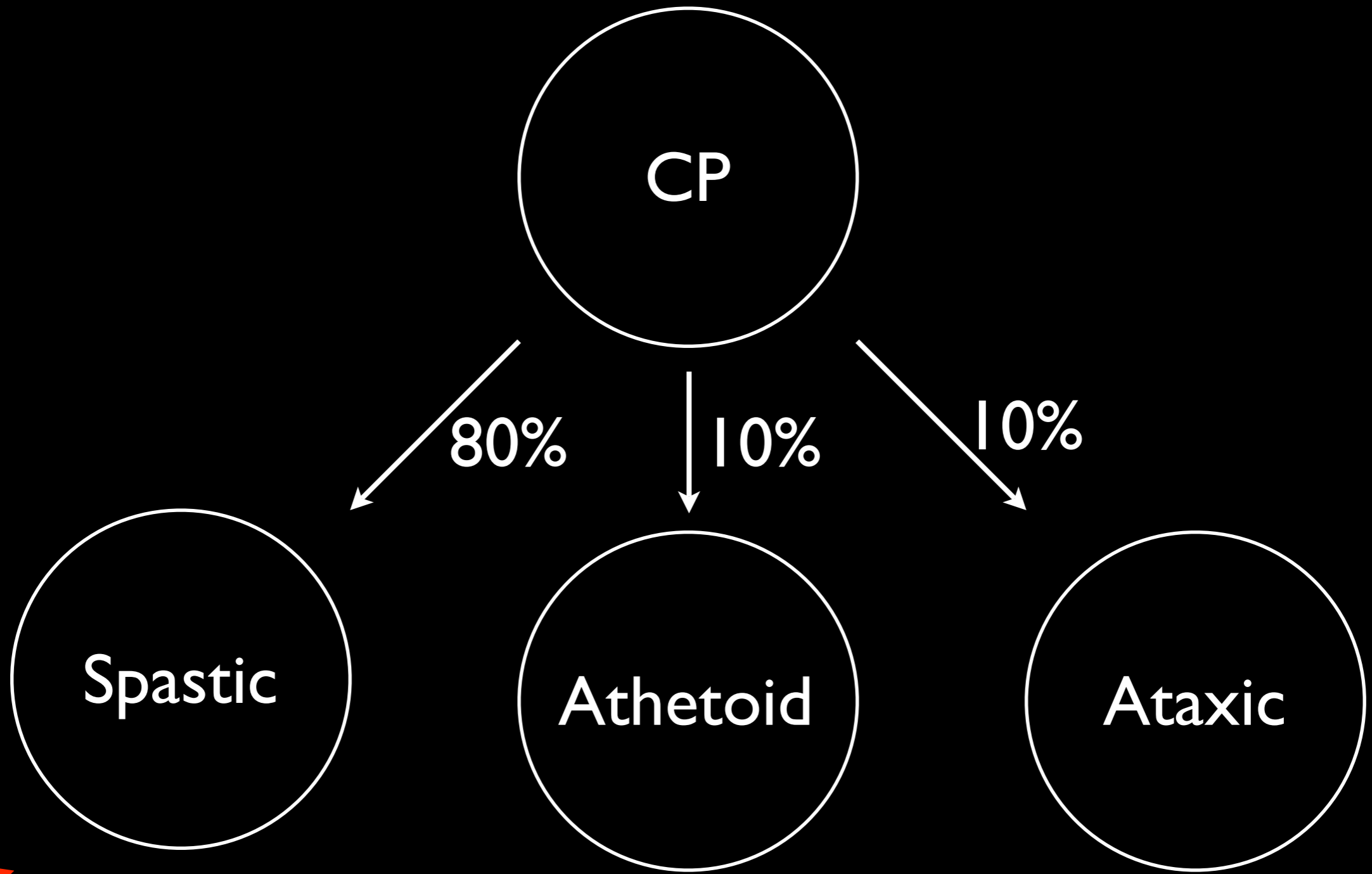
City of Kanpur

The Spastics Centre Kanpur was registered in April 1990, to provide help and guidance to spastic children and their families. The Centre is the first of its kind in Uttar Pradesh to concentrate solely on the care of children with spastic and related disabilities, chiefly locomotor handicaps. Our goal is to help such children realise their potential and to become useful members of society.

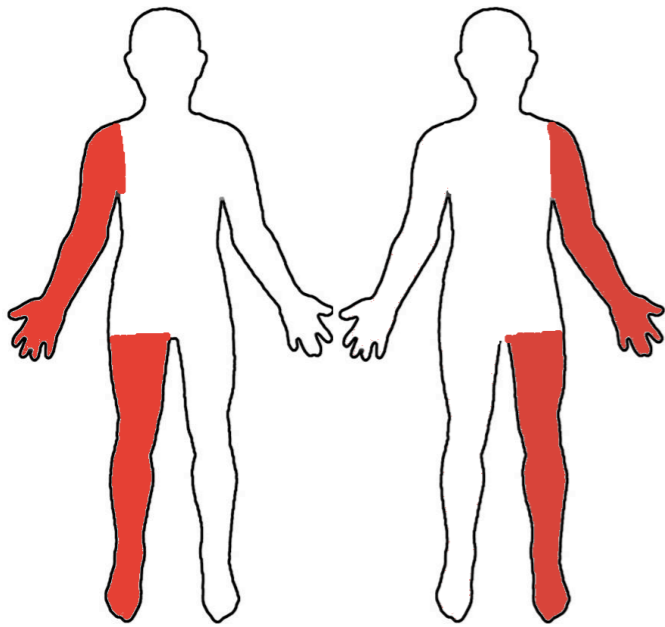
The programme we have undertaken is outside the scope of hospital treatment, and fulfills a felt need of children stricken at birth by brain damage. This is a condition known as Spasticity (the technical term for which is cerebral palsy). Lacking knowledge and guidelines, parents often try to cope with the problem

on their own, and feel sad and inadequate when they see no improvement. They do not know what to do and where to go.

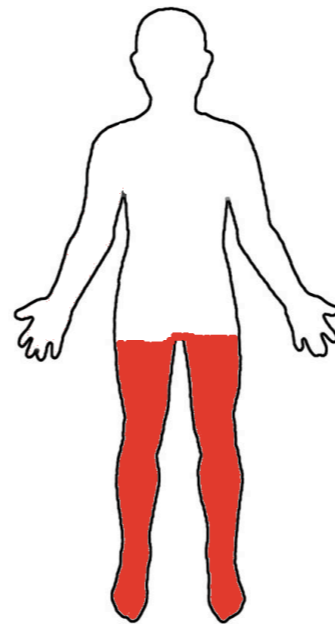
“...non-progressive congenital neurological
dysfunction...”



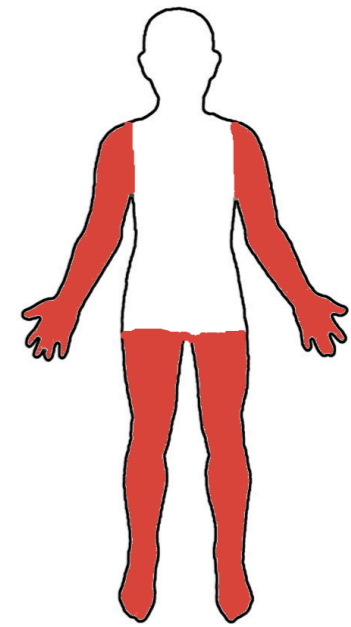
Spastic CP is further classified into mono-, hemi-, and quadriplegic cases.



Hemiplegia



Diplegia



Quadriplegia

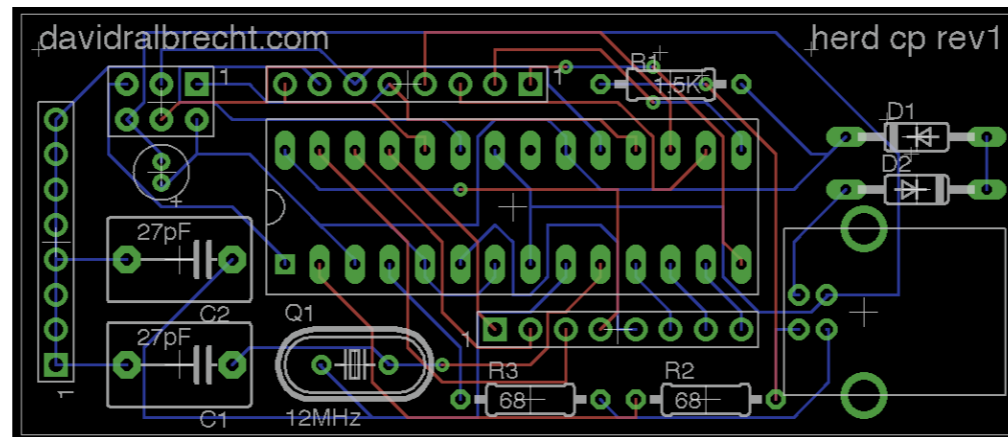
In addition to reconfigurability, we chose to focus on cost and ease of setup.

Reconfigur-
ability

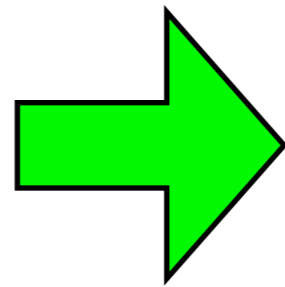
Ease of
setup

Cost

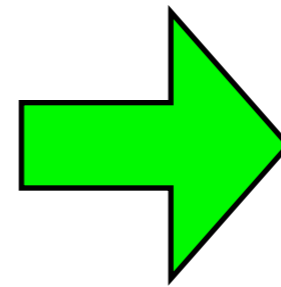
The design: a reconfigurable group of switches on the user's body, connected to a USB "keyboard".



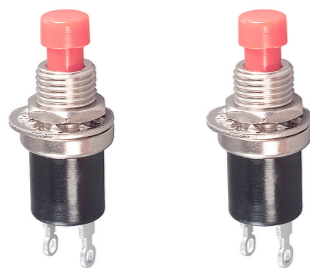
Switches



USB
HID

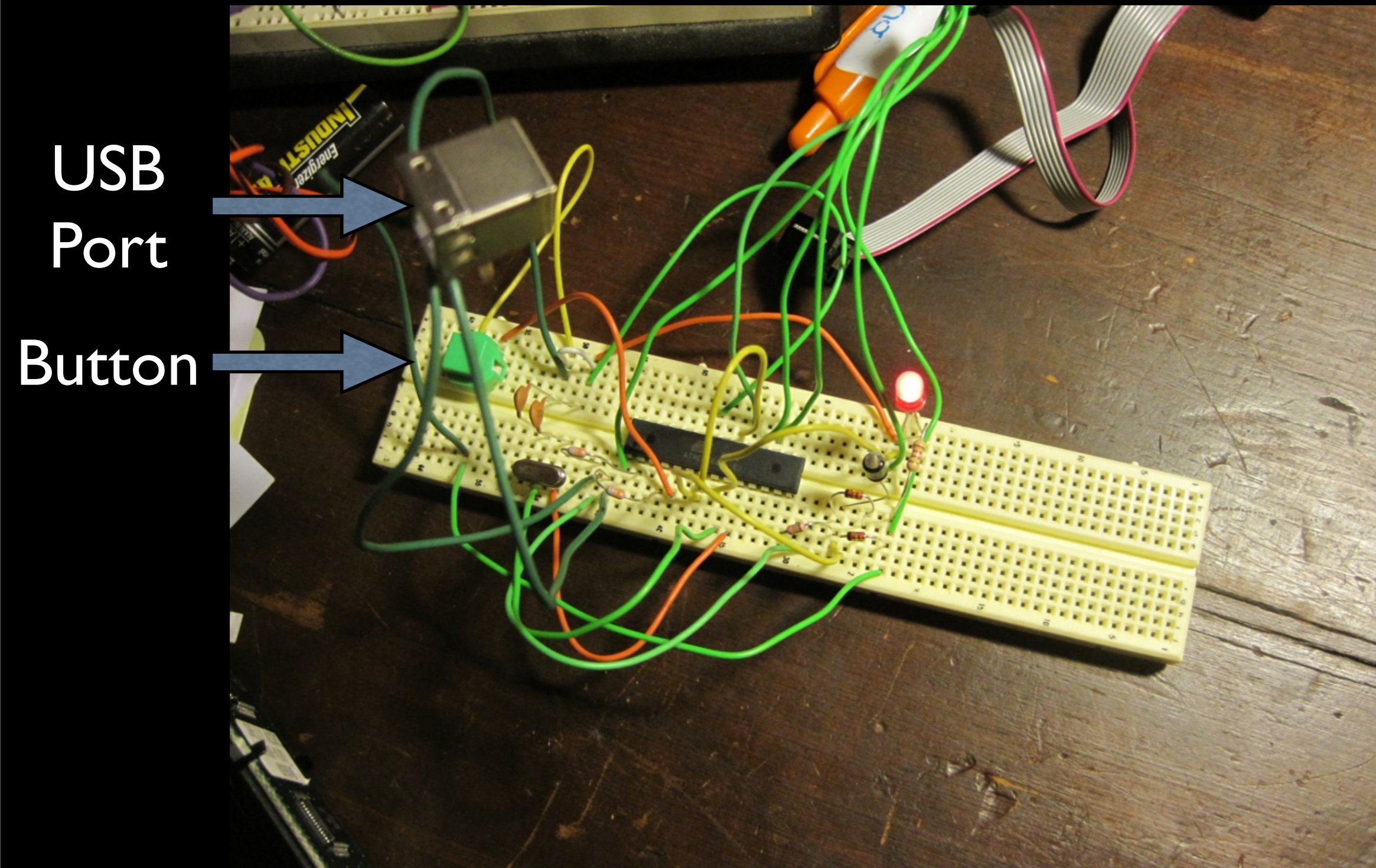


PC



Ease of setup vs. ease of use

Our design is based on HIDKeys on V-USB. I got this working on a breadboard with \$10 in parts.

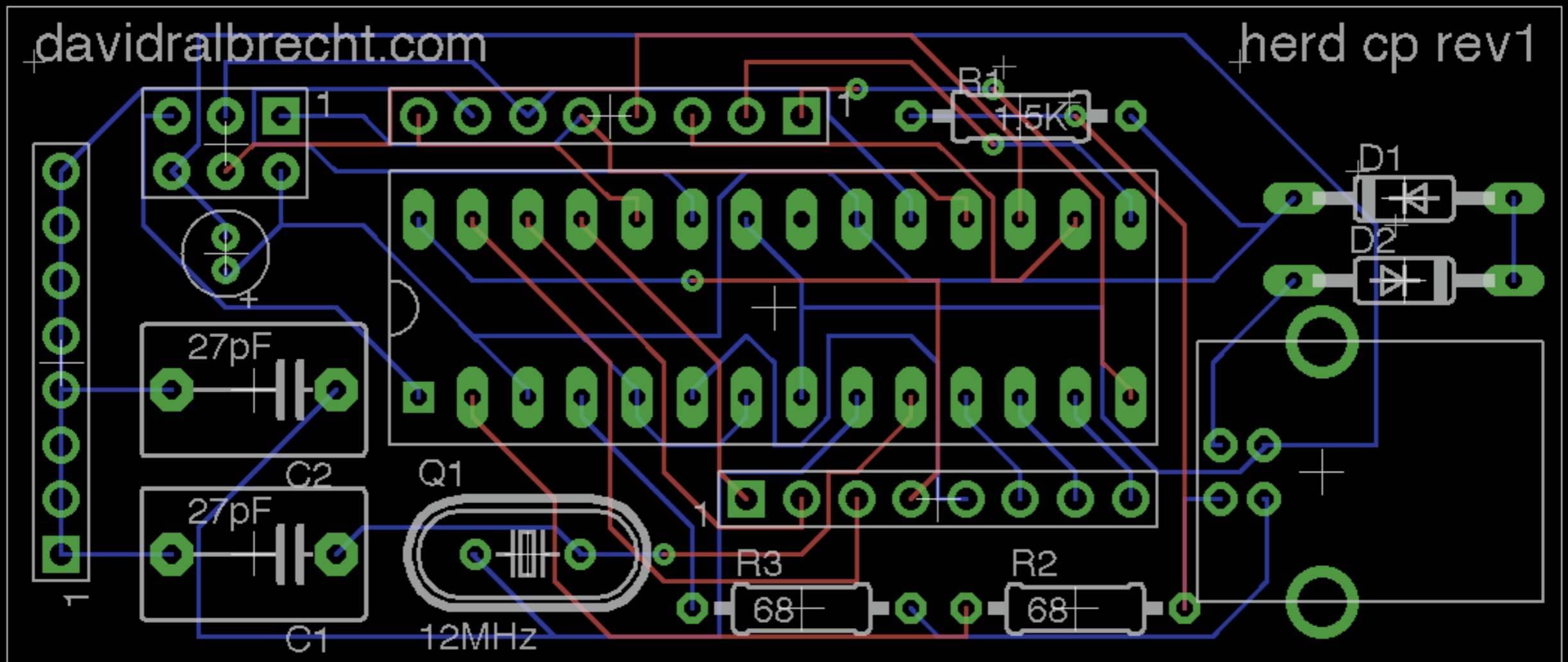


USB
Port

Button

Massive reduction in NRE through open source.

I designed a circuit in Eagle and got it fabricated by BatchPCB. Cost: \$8.



Next step: switches and software. Then production?

Bridging the hardware/software divide is a prerequisite to solving the next decade's most important problems.



Transit

Medical
Devices



Energy

Having fun making stuff since 2001.



If you want to get involved with this project, or want to talk about hardware/software hacking, contact me!

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Design will be posted to davidralbrecht.com