

# Knitting Machine Hacking

Bootstrapping a community

Steve Conklin



Cloud computing designed and built for developers.

# June 24, 2009 at NYC Resistor



Gigapan Demo Active Image: [Gigapan Web Site](#)

Susan and I doing hacker space tourism

Makerbot: Adam Mayer, Bre Pettis, Zack Smith

The knitting machine (Brother KH-930) was spotted on the shelf

We ended up buying a Makerbot kit AND a knitting machine.

# What's in a knitting machine?

- 1980's Japanese electromechanical technology
- “needles” are moved on the fly as carriage passes
- A progression of changes from pure mechanical to electronic controls.



# Why Bre is Important in this

- He got fired up and assembled the equipment
- He decided to let go gracefully
- He passed it to someone else with interest

# I Dive In

- This is an area I'm really strong in
- I figured out the electrical interfaces
- Session tomorrow on reverse engineering!
- Revelation: The external drive is a PDD1
- Can't find a PDD1? Write an emulator
- I discovered the kminternals group and John HogerHuis work from 2004. 2004!

# Lessons So Far?

- Let go gracefully
- Document everything, no matter how trivial
- Publish results, even incomplete
- Make them findable
- Everyone stands on the shoulders of others

# Cracking the Data Format

- Get the emulator working (found Tandy docs)
- I had a place to start (John's docs)
- Painful iteration (change, save, diff, document)
- This is many hours of boring work
- Hooray for Document Liberation Project
- Obsessed? A bit, . . . maybe.



# I Go Public on kminternals

July 16<sup>th</sup>, 2009:

I announce the disk emulator, and that I intend to start on data format  
GPLv2

July 28, 2009:

“I have made very good progress on the brother knitting machine file format.  
There is a link to the information from this page:

<link is now dead>

I have also started a python class to interface with these files. That class is read only at this point, but I am also playing with an application to program custom patterns, and that will require adding writing capabilities. Links to that software are also on the above page.”

# My Tools

- The Disk Emulator
- Pattern Dumper
- Pattern Inserter (hard to use)
- Banner generator

# First Major Exposure

- Nov 2nd, 2010: Becky Stern, [Blog Post](#)  
*“Hacking the Brother KH-930e Knitting Machine”*
- Becky and Limor at Adafruit fixed some bugs
- [Adafruit git repo](#)

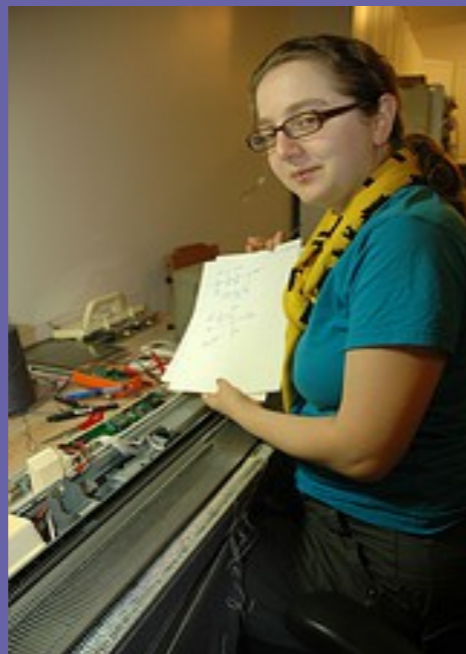


Photo: Becky Stern



# Travis, Fabienne, Arjan

“Hacking a Knitting Machine's Keypad”

Adds computer controlled loading using emulator





# Fabienne Serriere

- Used the code base [\(Blog Link\)](#)
- Script to convert image format
- Algorithmic pattern generation
- Mate Cozies



# Electronic + Textile Institute Berlin

- Victoria Pawlik
- Lots of knitting machines and lots of activity



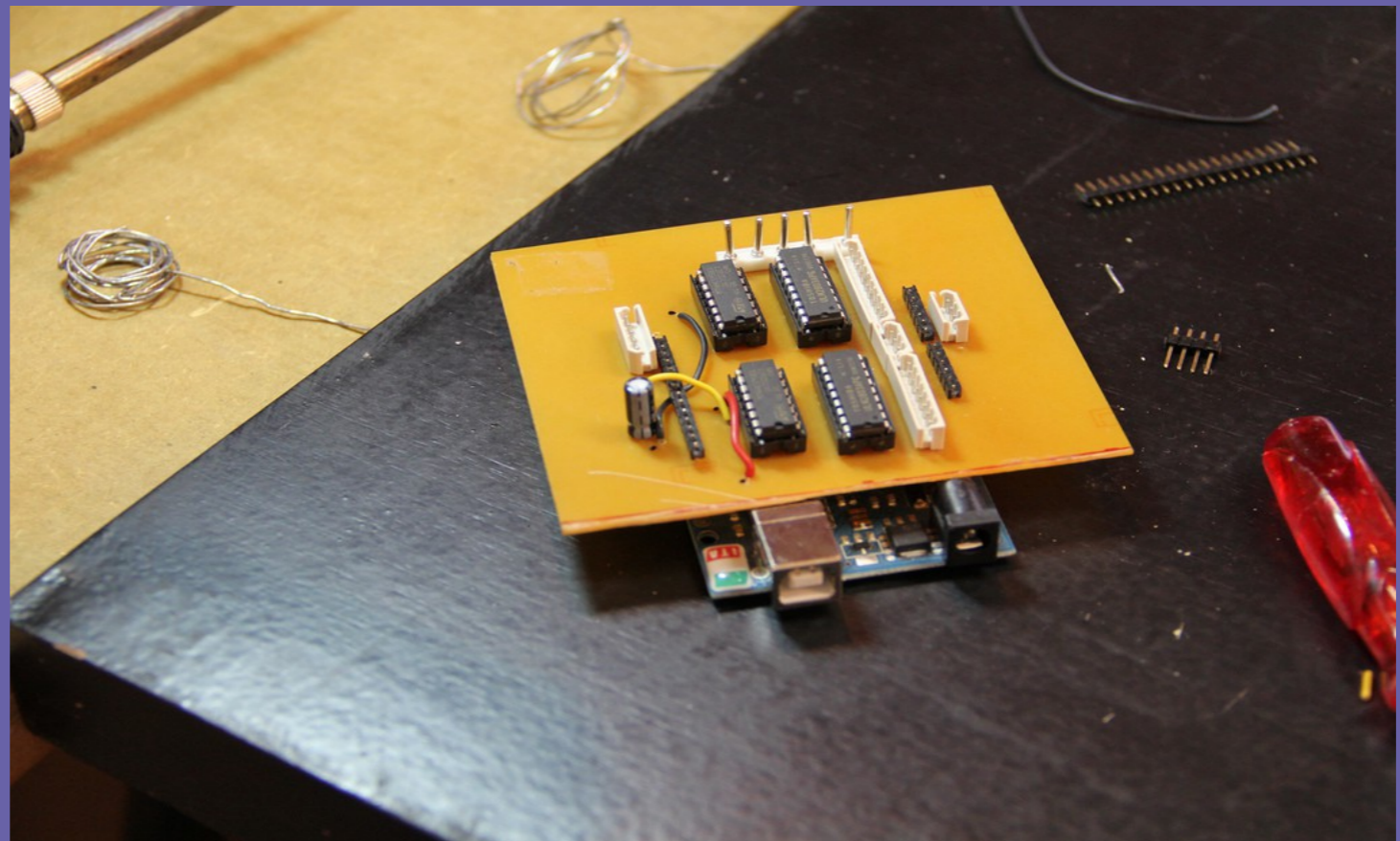


# Knitic

Mar Canet and Varvara Guljajeva

Replacement controller board for knitting machine

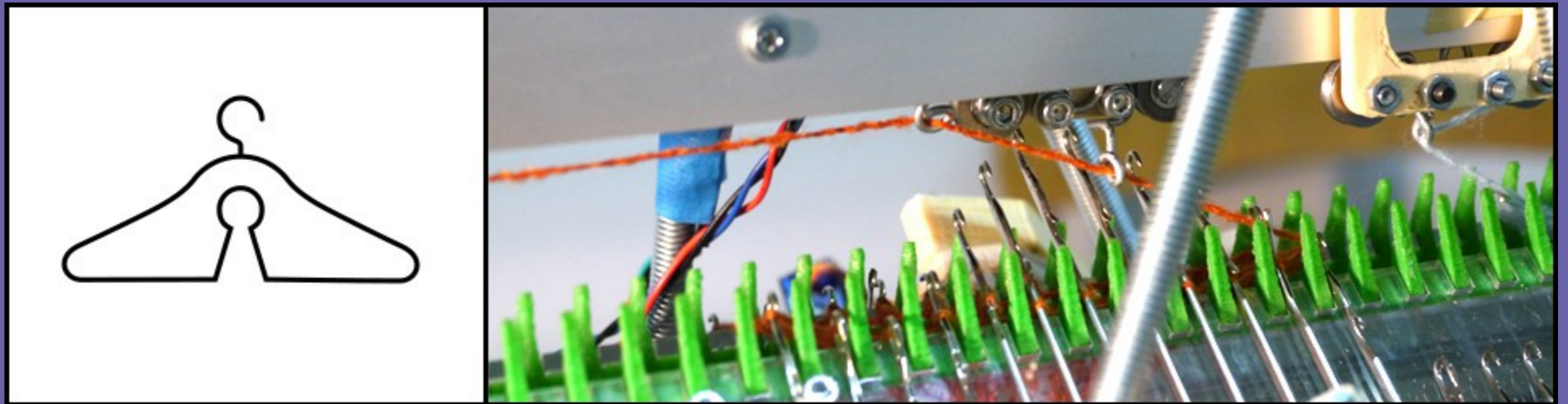
[WWW.KNITIC.COM](http://WWW.KNITIC.COM)



# New Machines

Gerard Rubio OpenKnit

Design a new computer-controlled machine



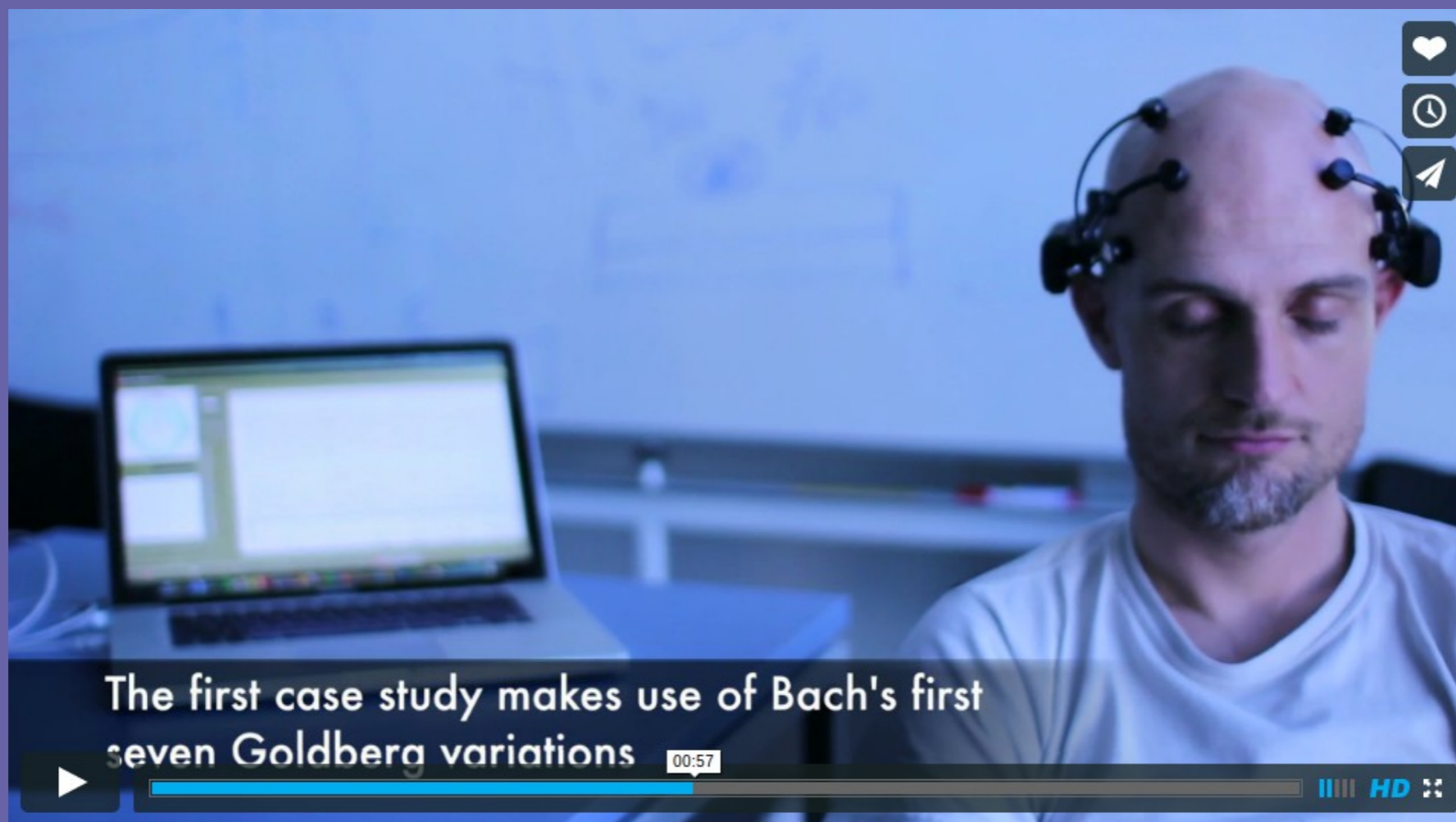
[WWW.OPENKNIT.OR](http://WWW.OPENKNIT.OR)  
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# NeuroKnitting

Mar Canet and Sebastian Mealla

Plotting brainwave activity into knitted patterns



# Andrew Salomone

Numerous projects

<http://andrewsalomone.com/>



An Open-Source Balaclava for Pussy Riot

# Davi Post

Img2track <http://daviworks.com/knitting/>

Image file to knitting machine with GUI

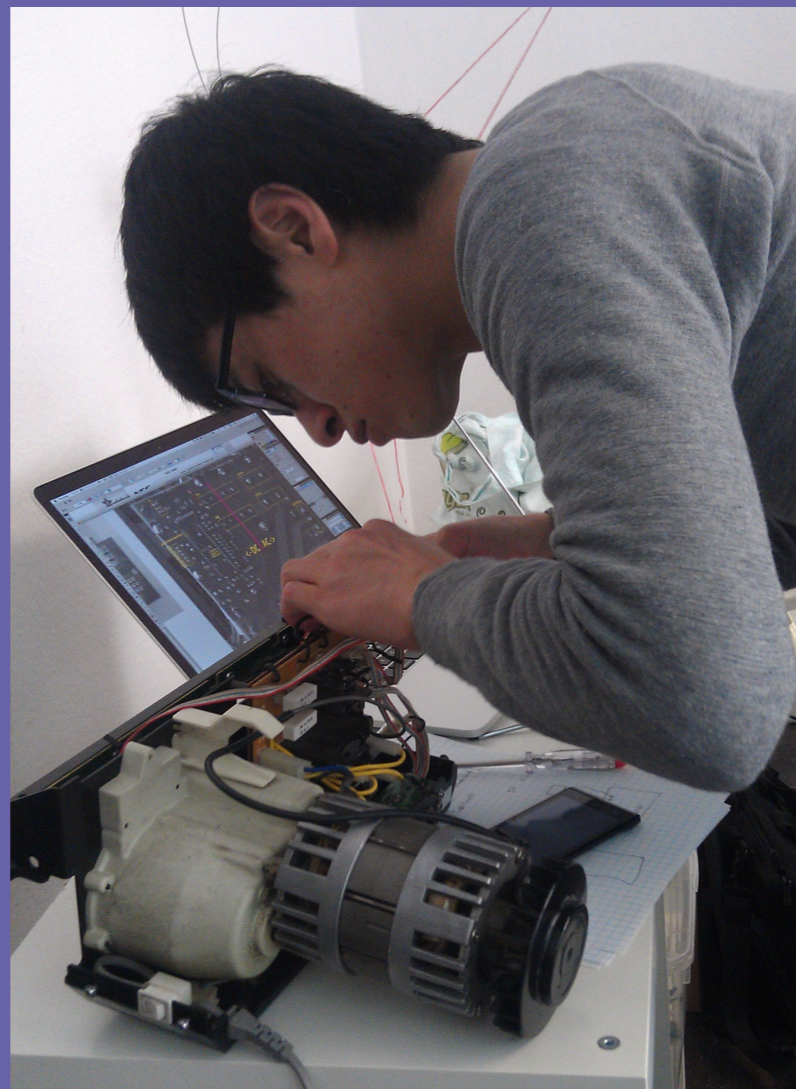
Cross platform

Davi extended knowledge of the data format

# So Kanno

Artist working at ETIB

Working to extend applications of Knittic





# Glitch Knit

Kanno, Nukeme, and Tomofumi Yoshida

Not based on the codebase I started, but cool!

<http://kanno.so/glitch-knit/>

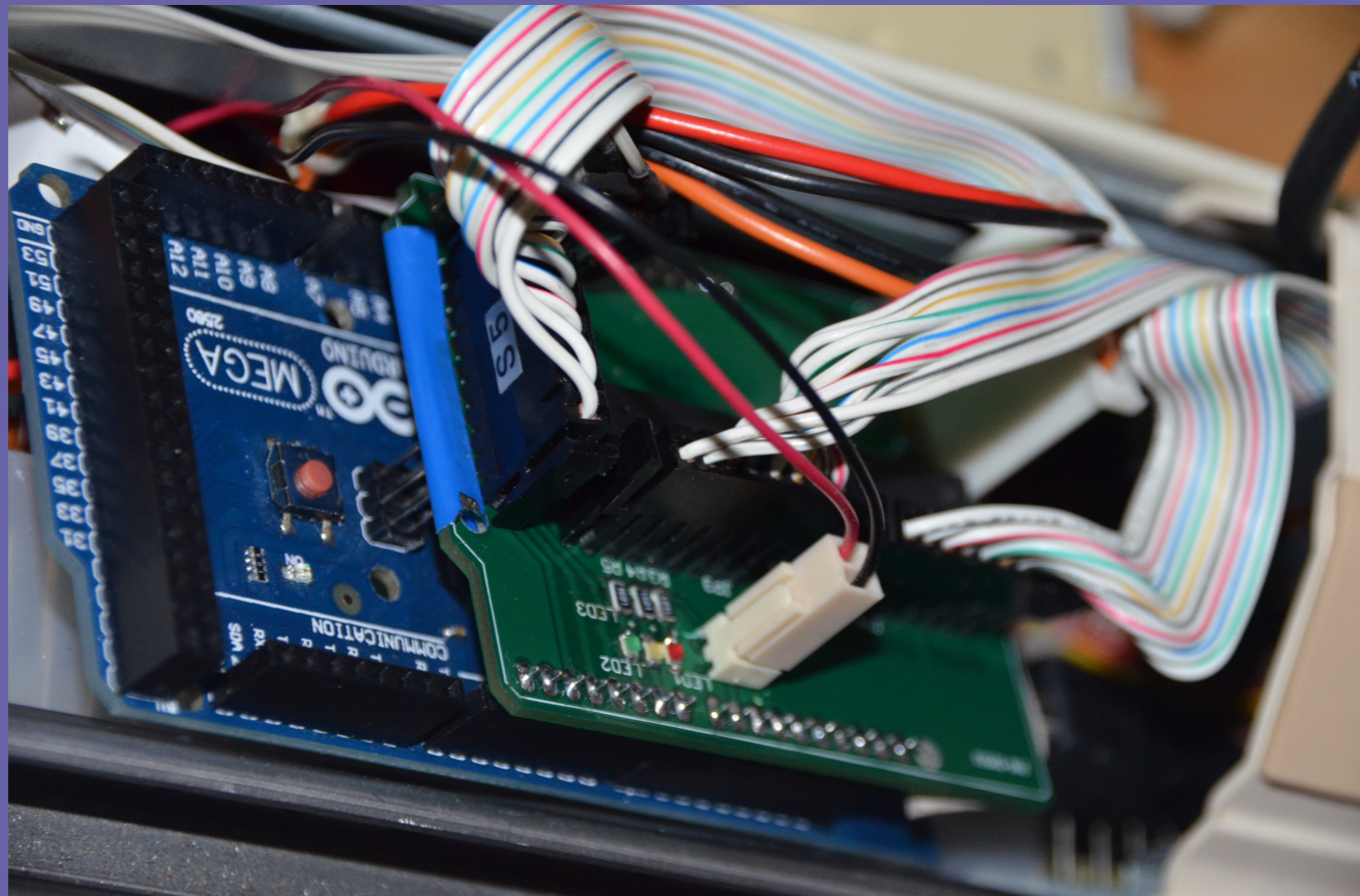


# All Yarns Are Beautiful

<https://wiki.muc.ccc.de/ayab>

Arduino shield board for Brother KH-910

Brings computer interface to cheaper machine



Fini