Let’s Build Our Own Personalized Open Textile Production Line

Hong Phuc Dang, 31c3

fashiontec.org
About me

Hong Phuc, FOSSASIA, Textiles
@hpdang
@fashiontecorg
@fossasia

I am from Viet Nam
Let’s make a Revolution for the Textile and Garment Industry?

The system is broken.

Let’s fix it.
TEXTILE and GARMENTS just aren’t fair. Night work in the not so shiny parts of Dubai

It’s not like in the big sweatshop factories but it’s still hell!
Globalisation race to the bottom in consumer prices and prevailing of the worst working conditions - Here Nike Sweatshops in China and Vietnam
Crashed Garment Factory in Bangladesh “as seen in the news”
I make 115 USD per month. This is 4.40 Dollar per day. My average shift is 13 hours per day.

I am working in the Tay Do Factory in Can Tho, Vietnam. One month has 26 working days.
TEXTILE and GARMENTS just aren’t digital

Machinery stuck in the 80s:

manual labour is cheaper than tech upgrades.
TEXTILE and GARMENTS just aren’t environmentally friendly.

Textile dying & treatment ... 

17-20% of industrial water pollution

72 toxic chemicals originate solely from dying

30 of these cannot be removed

© China Water Risk
TEXTILE and GARMENTS just aren't local anymore.

Marginal garment production in Europe and the US

Traditional Knowledge (tk) gone.
Clothes don’t fit!

No standard sizes even within the EU but plain CHAOS.

Women have issues to find the right clothes for their bust size.

Men’s shirts never seem to fit the arm length.
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No room in the current large industry model for made-to-measure clothing in tools and design.
The broken Production System

1. Tools are expensive not interoperable, proprietary formats
2. Designers choose manufacturers based on tools
3. Must order large batch size
4. Designers want quick revisions
The broken Distribution System

- Need huge distribution channels to handle huge production runs
- Small & medium designers get no access to industry channels
- No space for smaller designers in corporate stores like H&M, Zara, Esprit...
For designers

Broken Textile & Garment Industry

Distribution

Production

For customers
HOW to get it right for Yvonne & the rest of us
We will Solve the Challenges in the Industry and build our own local production lines

New interfaces for garment and textile production:

- Free Open Source Tools (Software + Hardware)
- Open Data Formats
- Open Garment Marketplaces
What is happening already

Examples

- **Neck**
  - Put the measuring tape around your neck right below the Adam’s apple or voice box. To provide some extra space and to ensure a comfortable fit please put one finger between the neck and the tape.

- **Chest**
  - Take the chest measurement at the fullest part of your chest. Pass the measuring tape directly through the armpit and across the fullest part of your chest while keeping it at the same level on the back. Stand in a relaxed upright position and breathe out while measuring.

- **Waist**
  - Take the waist measurement at its fullest part, usually right above your navel. Stand upright and relaxed and breathe out while measuring.

- **Front Width**
  - The front width is measured at chest level from the left-hand side intersection of arm and chest to the right-hand side of the same intersection. Please keep your arms straight and close to your body while being measured.
3D Body Measurements

Prototype Showcase: freelayers.org

Free Software - Code: github.com/fashiontec/
Body-Apps International Contributors

Joerg Henning (Germany)  Prashant Kiran (India)  Ayantha Randika (Sri Lanka)  Vishv Brahmbhatt (India)  Mario Behling (Germany)
Open Formats - HDF

- Human Definition Format
- Container format, similar to ODF
- Structured data (XML) + binary (images)
- MIME: “application/vnd.org.valentina.hdf”
- [github.com/fashiontec/hdf](https://github.com/fashiontec/hdf)
Open Source Patternmaking

Tau Meta Tau
Processing
Project Valentina
float A Dy = A Cy;
float A Ex = A Ax;
float A Ey = A Dy - front_shoulder_height;
float A Fx = dist(ACx, ACy, A0x, A0y) + 1/2;
float A Fy = A Ey;
float A Hx = A Ex + neck_width/2;
float A Hy = A Ey;
float A Gx = A Fx;
float A Gy = A A x - (dist(AAx, AMy, AEx, AEy) - sqrt(sq(front_shoulder_seam) - sq(dist(AHx, AHy, AFx, AFy))));
float A Jx = A Dx;
float A Jy = A By - 1.375 - (1.014*side_seam_length);
float A Kx = A Dx + front_full_width/2;
float A Ky = A Dy;
float A Lx = A Kx;
float A Ly = A Ky + side_seam_length;
float A Mx = A Dx;
float A My = A Dy;
float A AX = A My + sin(45)*7/8;
float A AY = A My - sin(45)*7/8;
float A Bx = A Ex;
float A By = A Dy + dist(AEx, ABy, ACx, ACy)/2;
float A Px = (AEx + AFx)/2;
float A Py = ABy;
float A Qx = A Ox + dist(AOx, AOy, APx, APy) - 1/2;
float A Qy = ABy;

// code for the front bodice start from here
size(500, 500);
scale (15.8, 15.8);
translate (18, 18);
noFill();
Patternmaking Project Valentina
A Qt5 free software app
available for Linux, Windows, Mac
Dev: Roman Telezhinskyi (Ukraine)
bitbucket.org/dismine/valentina
Embroidermodder

Create your own embroidery designs in the CAD program.

Then generate embroidery files for home or commercial machines.

github.com/Embroidermodder/

Josh Varga  Jonathan Greig
Customized Knitting Patterns

Knyttan shop in London connects Designers to People to make clothes that last

Ref. knyttan.com
Open Source Knitting

Open Knit: Gerard Rubio
Video: vimeo.com/90035643
Hardware: github.com/g3rard/OpenKnit
Knitic Software: Mar Canet
github.com/mcanet/knitic
AYAB Knitting

all yarns are beautiful

Live Demo: Christian and Andz (Munich) | ayab-knitting.com
What are the next steps: We need more machines to hack and liberate fashiontec maker spaces, software developers & designers to restart local production everywhere and control environmental standards, makers to start their own businesses and Open Fashion Stores.
Our Own Personalized Open Textile Production Line - How can you help

● Hacking machines - sewing, stitching, crocheting, embroidery machines
● 3D printing experts to build our own machines
● Join our OpenXLab network of makers
● Your idea <here>
Where to meet #FashionTec in 2015

FOSDEM, Brussels, Jan 31/Feb.1 (Room Internet of Things)

FOSSASIA, Singapore, March 13-15 (Open Hardware Track)

OpenTechSummit, Berlin, May 15 (Open Hardware Track)

MeshCon FashionTec Week, Berlin, Oct. 6-12
Thank you

Hong Phuc Dang

Twitter
@fashiontecorg
@hpdang

fashiontec.org

-> Questions