



Stitch and Solder

Wearable Technology

DESIGNING WEARABLES

Where Electronics Meet Textiles

Workshop with
Lynne Bruning and
Troy Robert Nachtigall

Sponsored by
Spark Fun and PlugandWear

THEORETICAL DESIGN PROCESS

WEARABLE TECH IS NOTHING NEW



1268 Glasses



1801 Jacquard Loom



1762 Pocket Watch

cognitive science

media & entertainment

engineering

architecture

anthropology

technical communication

design studies

business

industrial engineering

instructional design

e-learning

interaction design

art

history

cultural studies

ergonomics

law

management

fashion design

telecommunications

education

journalism

industrial design

fiber arts

visual design

information systems

software engineering

interface design

interior design

graphic design

landscape architecture

software design

medicine

business

urban planning

linguistics & semiotics

sociology

electronic engineering

artificial intelligence

psychology

Wearable
Electronics

Electronics
Industry

Zeitgeist

Design
Process

Wearable
Technology

Socio
Economic

Functional
Clothing

Textile
Industry

Fashion

Design Process

Textile
Technology
Research

Fashion
Development

Fashion
Research

Strategy

Prototipe

Electronic
Technology

Electronic
Development



PRIMARY DESIGN CHALLENGES

- Wearability
- Washability/Durability
- Standards & Interoperability
- Reference Designs
- Design Process
- Security & Privacy
- Ethics



PRIMARY DESIGN ISSUES

- Clothing
- Finance
- Gender
- Shopping and Marketing
- Ageing
- Accommodation
- Education
- Travel and Exercise
- Health

RAE DESIGN STANDARDS

- Originality

The degree to which the work and its organisation have evolved.
New methods, insights and formulations from known forms and practices

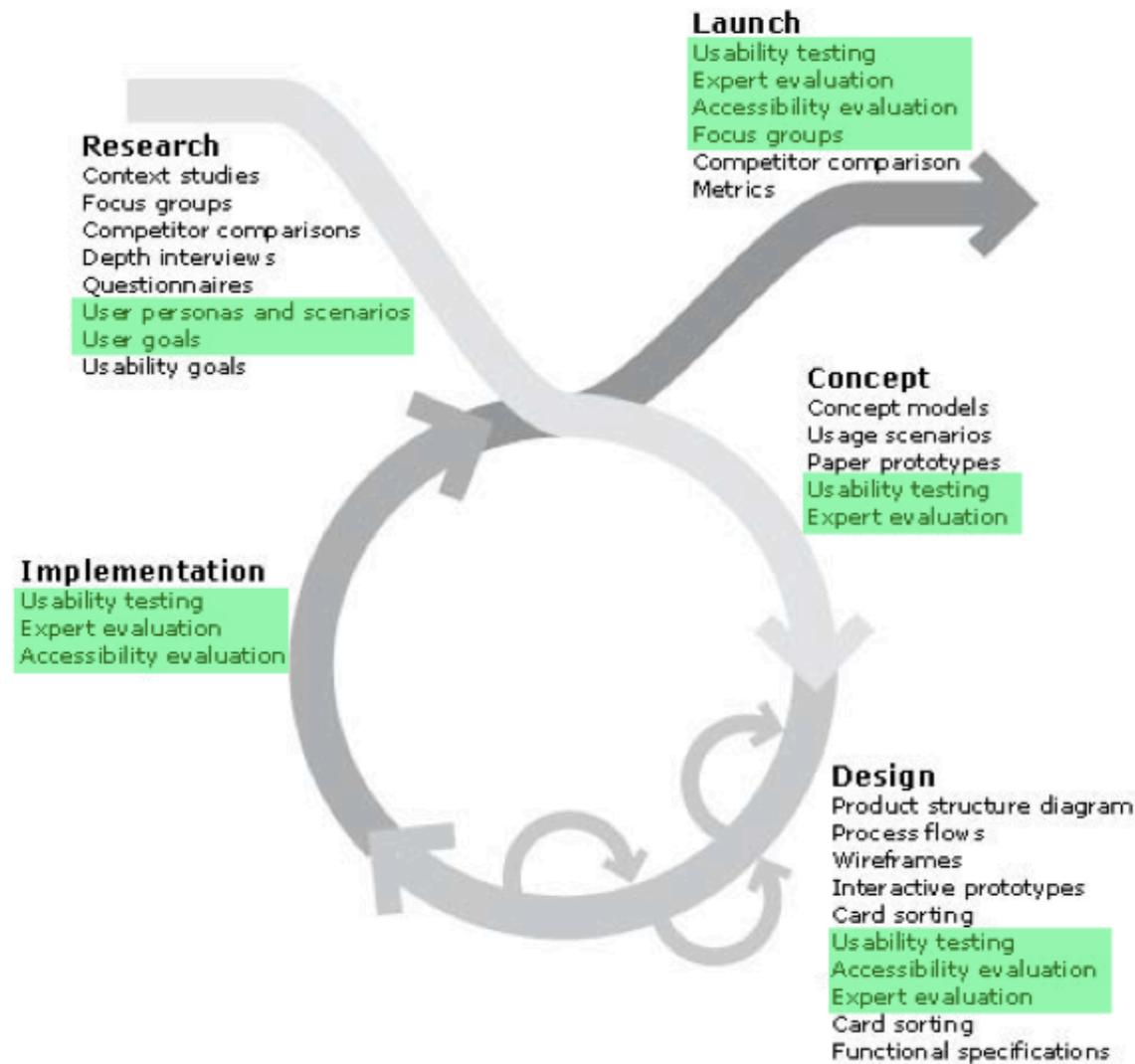
- Significance

The degree to which the work and its organisation have enhanced, or are likely to enhance, knowledge or understanding in the field and the advancement of practice.

- Rigor

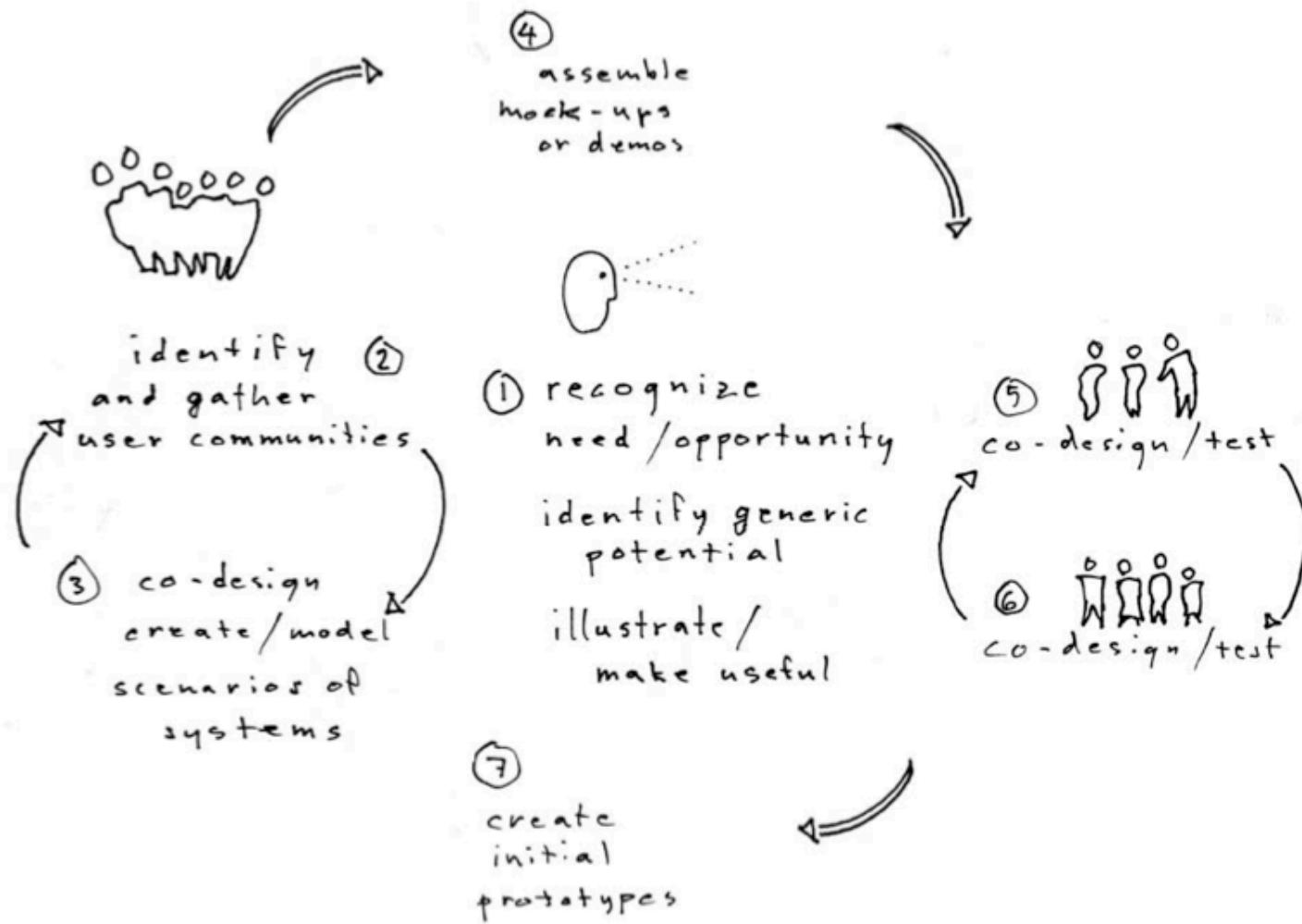
The degree of intellectual precision and systematic methods embodied in the research practice, its organisation and peer recognition.

User-Centred Design



Participatory Design Process

Diaz & Kommonen (2003)



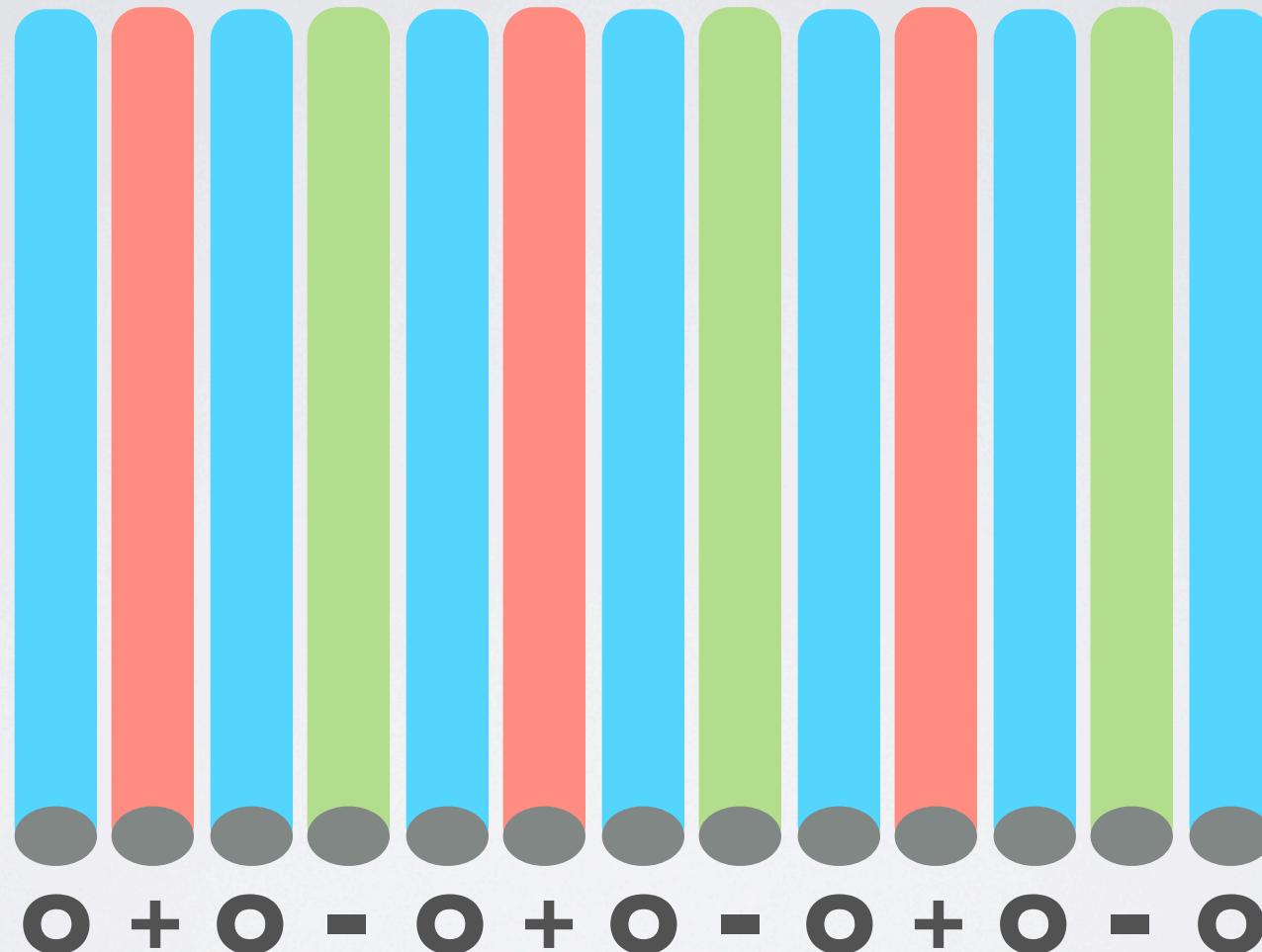
PRACTICAL DESIGN

OUR PROJECT

- Input
 - Electric Fringe
 - Textile Button
 - Soft Potentiometer
(Variable Resistor)
- Output
 - LEDS



CONDUCTIVE FRINGE

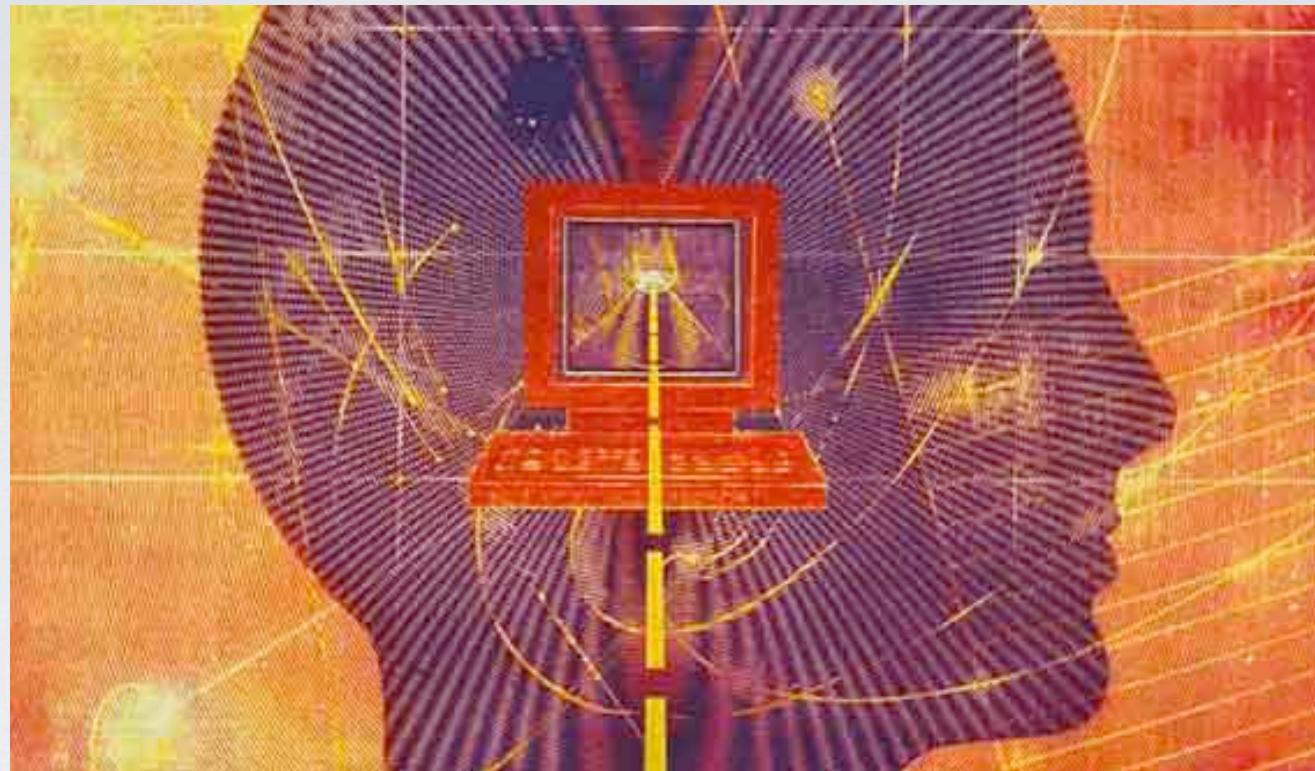


○ Insulator

+ Positive - PIN

- Negative - GND

BRAINSTORMING



- Break up into groups and brainstorm about what you can do with Input
 - Electric Fringe, Textile Button, Soft Potentiometer
 - LEDs

A FEW OF MY PROJECTS

Invista



Style:
6704.22



Style:
6704.91



Style:
5035.46



Style:
5035.61.3

Style:
5035.63

PURITY



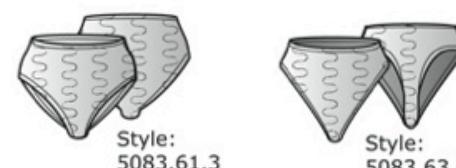
Style:
6705.55



Style:
6705.61



Style:
5083.54.3



Style:
5083.61.3

Style:
5083.63

TRUST



Style:
6706.46



Style:
6707.71z

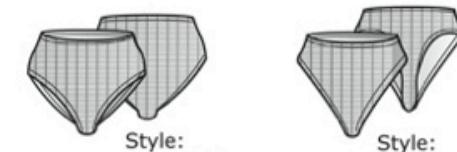


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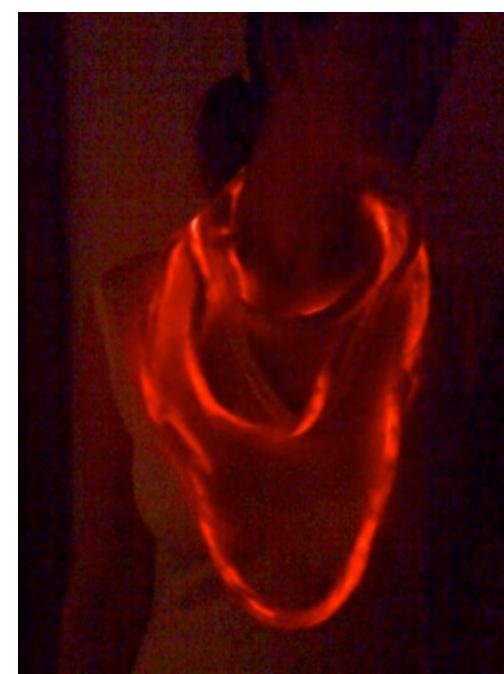
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SOUL



Jumper Jacket

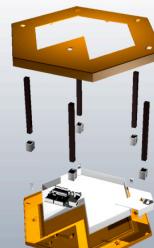
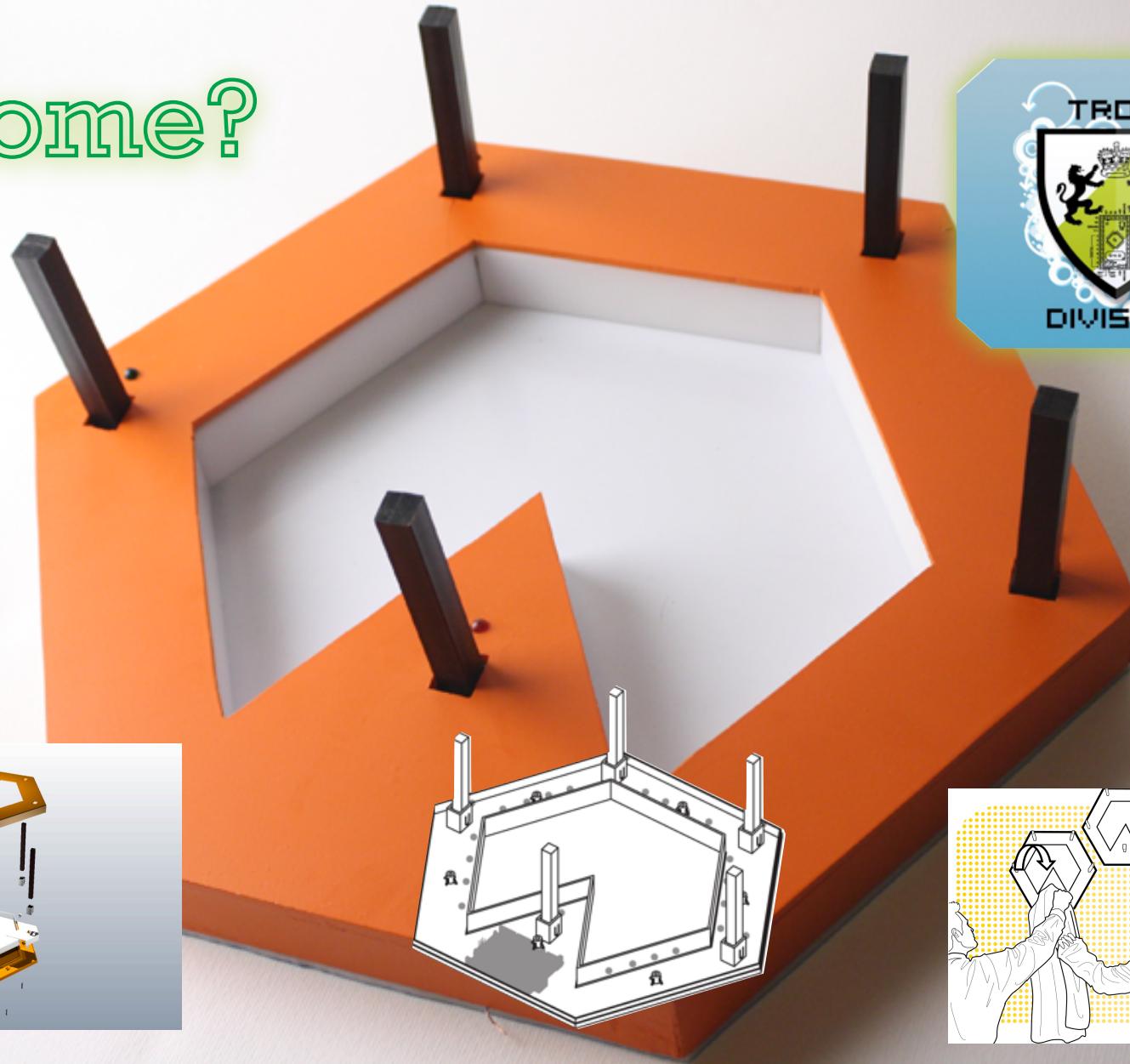




Interactive Felt



Who's Home?

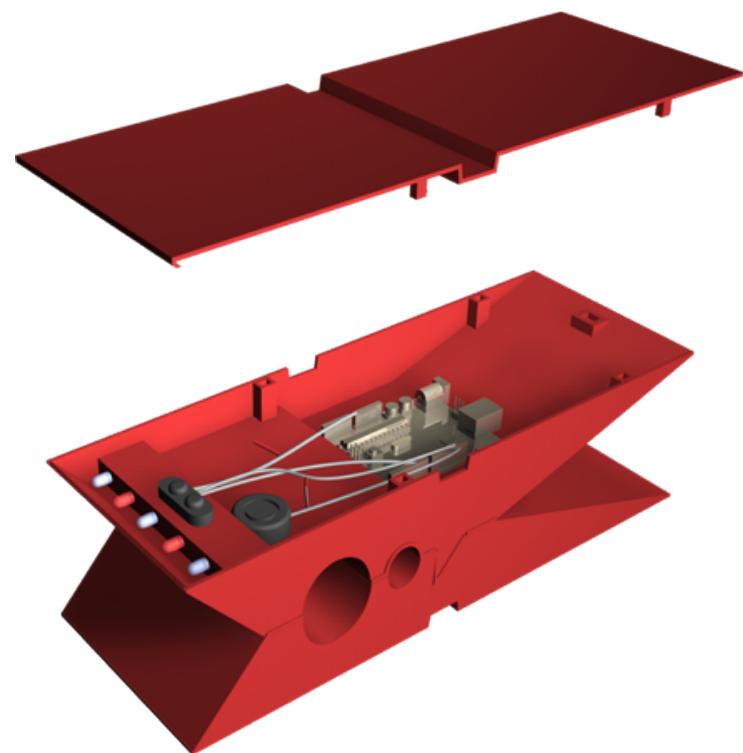


Coollar





CEST
MAGNAFIQUE



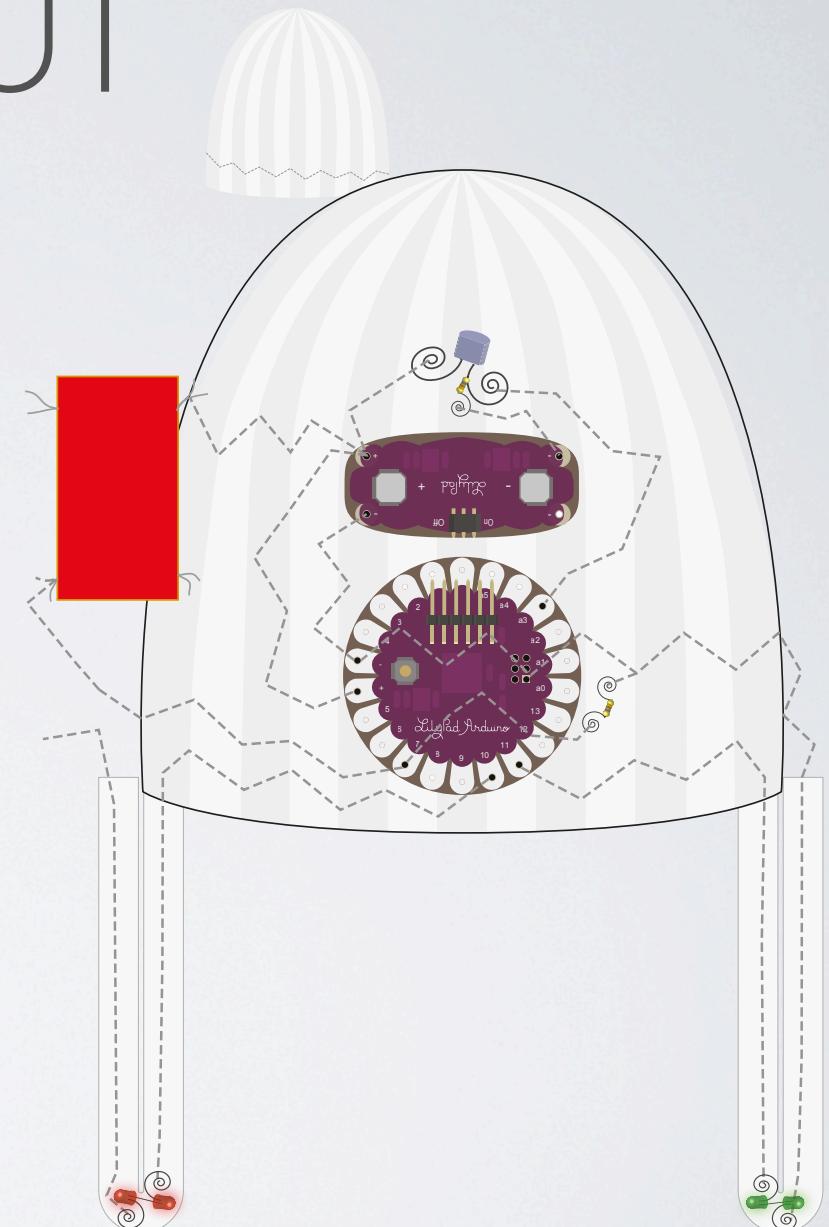


Helios Monome DJ Bag



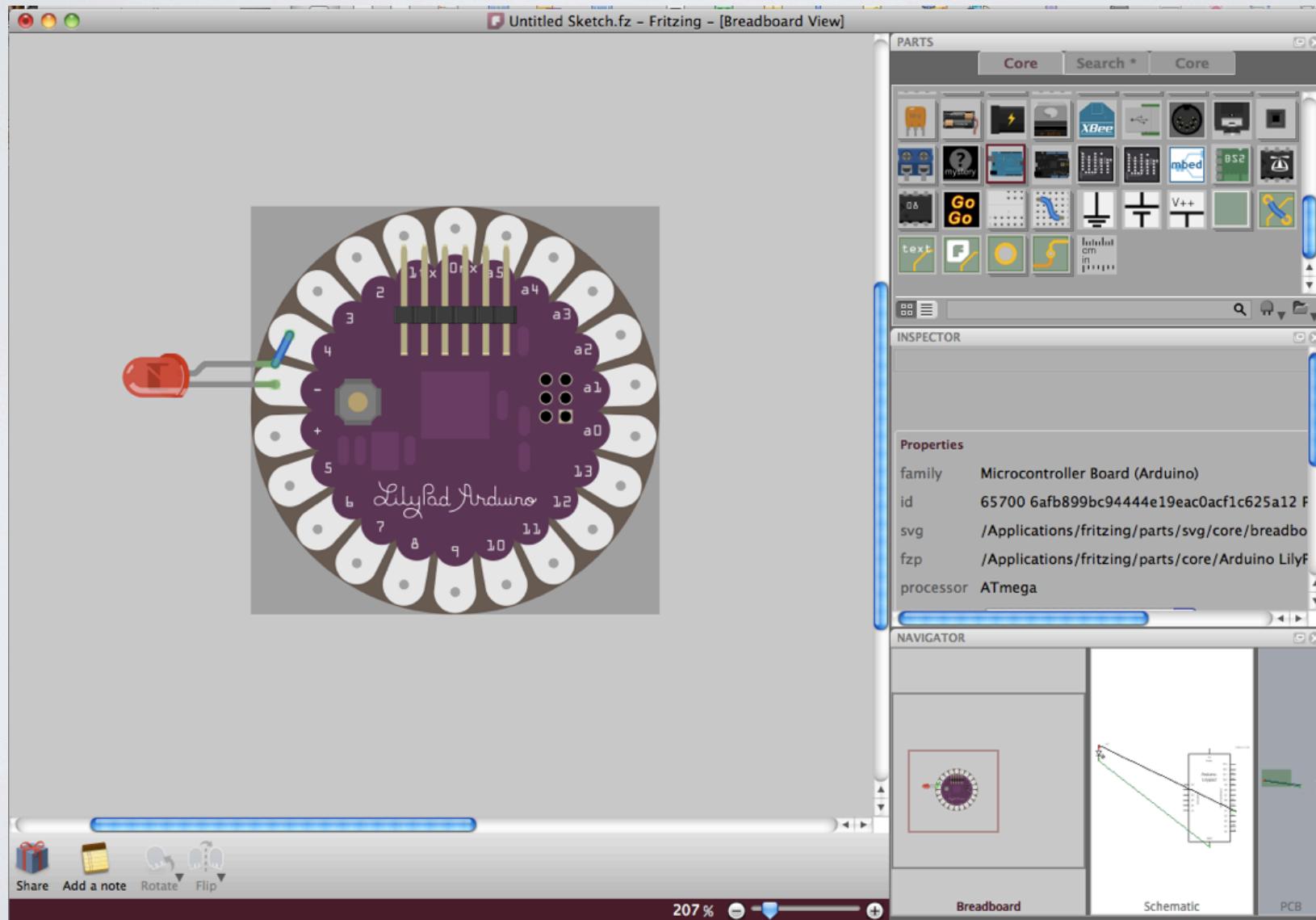
CIRCUIT LAYOUT

- One of the hardest parts of E-Textiles is laying out a project so that our conductive threads don't cross and short out our project.
- We need two design schematics
 - Physical Layout
 - Electronic Layout

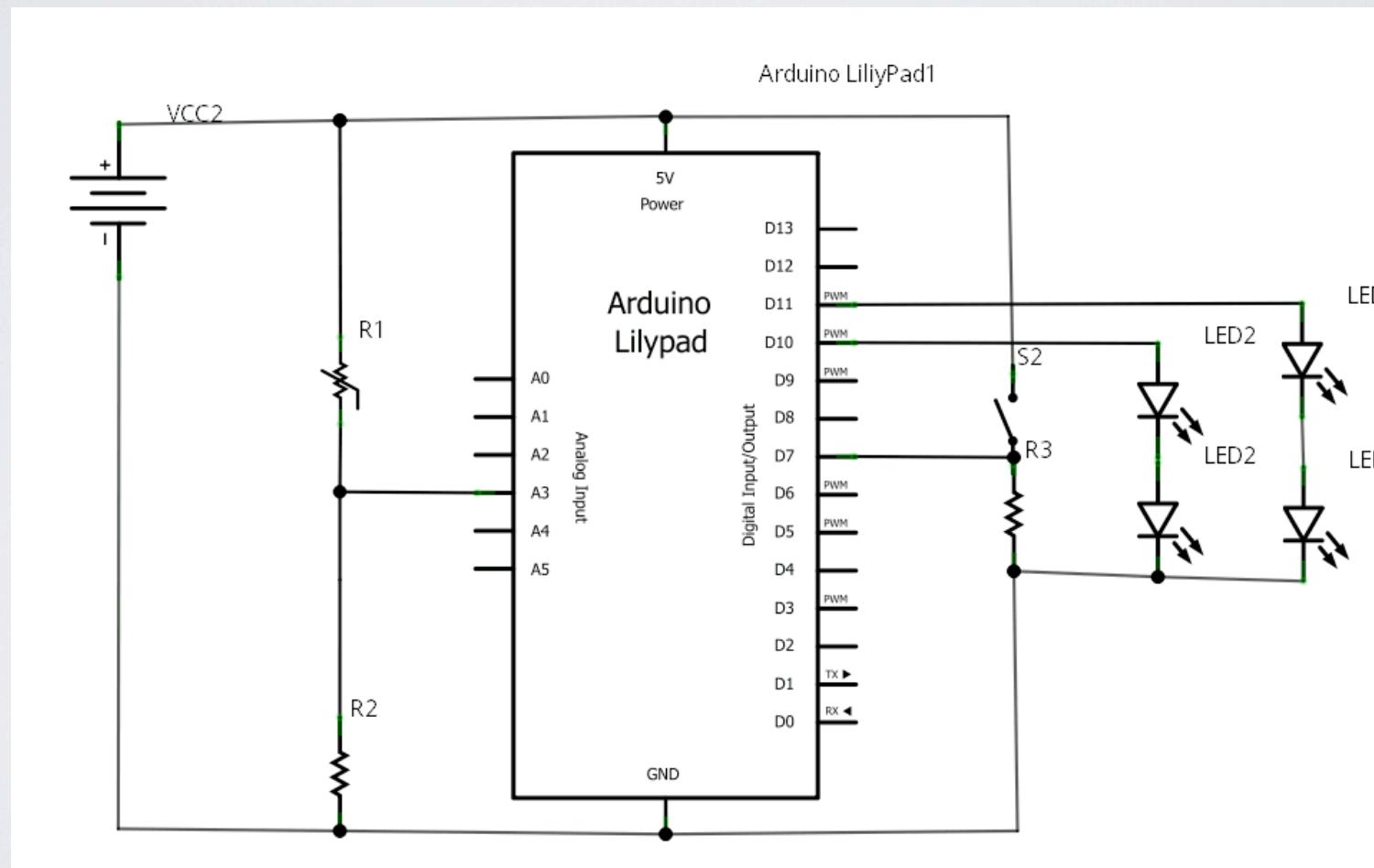


FRITZING

The super friendly Lilypad layout design program.



ELECTRONIC LAYOUT



DESIGN PROCESS

- Theoretical Design
 - Historical Wearable Technology
 - Related Fields

FOR TOMORROW

- Come with your design ready
- We have few minutes to buy extra parts from Spark Fun
- Feel free to prepare for tomorrow.



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INTERMEDIATE ELECTRONICS AND ARDUINO

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