OPEN DESIGN PRACTICES + WEARABLES + 3LECTROMODE

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This paper investigates open design strategies within DIY wearable practices and the collaborative initiatives of 3lectromode and other design collectives in the field of fashion and technology. It looks at how technologies are facilitating access and small production lines in the changing creative and production practices of fashion and technology—from an industrialized vs. craft-based one—to a high-tech, hybrid, networked cottage industry.
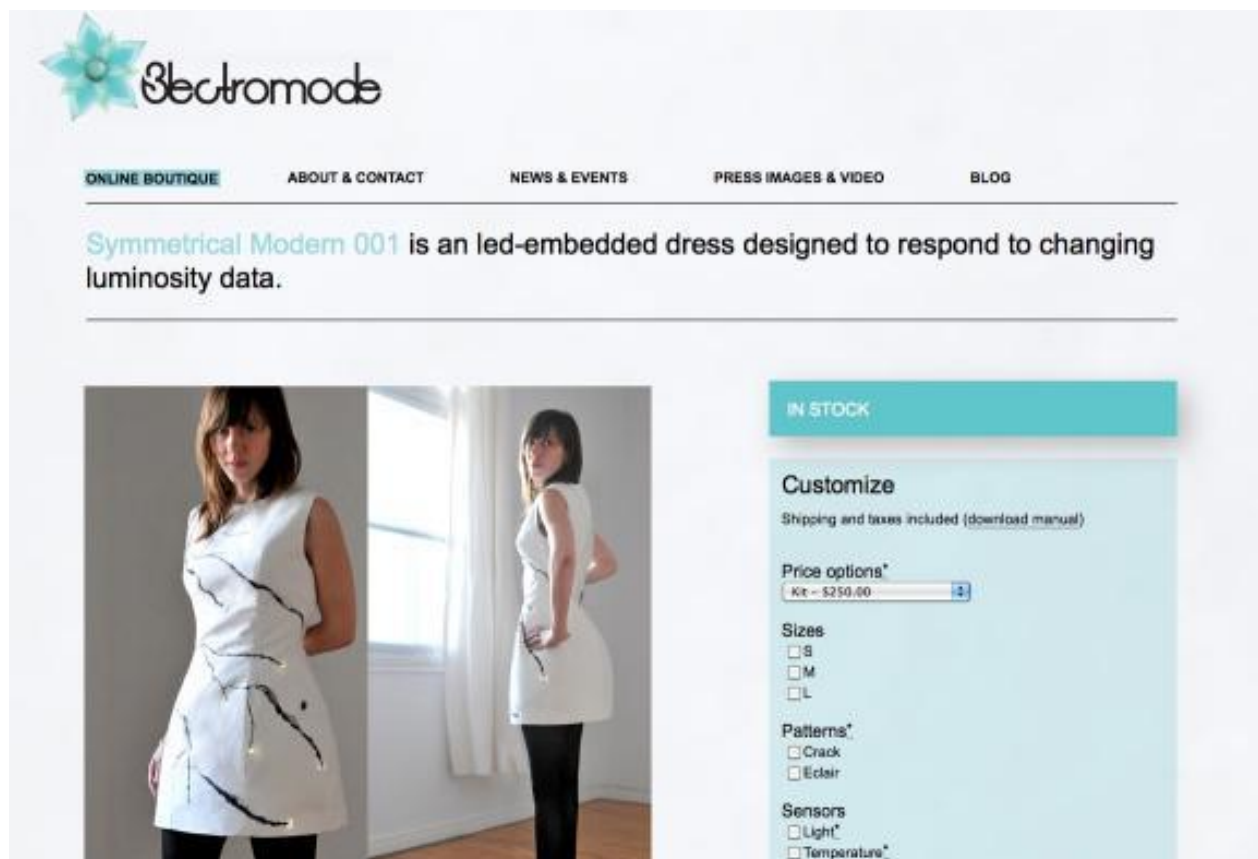
Fig 1. © 3lectromode website

Fig 2. © 3lectromode Asymmetrical Modern 001 (detail)

Fig 3. © 3lectromode Symmetrical Modern 001 Éclair

OPEN DESIGN IS ABOUT MAKING.

Open design is about making—it is about innovation in methods, materials, practices and technologies which are experimented in a hands-on, experiential, trial and error fashion. It is a practice invested in giving people the means to make things they could either have not made on their own or previously (because of lack of knowledge or access to technologies and methods) or would not have made on their own or previously (because of lack of exposure to the potential of new technologies, designs, materials and methods). Open Design is about tangible—material—dreaming. It is also about democratization of fabrication methods, aiming to include makers and users with no minimum experience standards, save lack of ideas or persistence. Open Design is also about a willingness to get your hands dirty, ask questions, mess around with materials, and question and contribute to ideas already in the air or literally on the table. Open Design is not so much about success or failure, but more about the process, about the relationship between ideas, people, machines and materials and how they come together to create a "thing".

OPEN DESIGN IS ABOUT ACCESS.

Open Design is about access—it is about putting the means, knowledge, techniques, technology and materials needed to make things easily accessible. Much of this access is done via internet culture promoting practices, tutorials, and information on where to find materials and services. Sites such as Instructables and Craft, featuring a wide range of technology and craft-based tutorials, are places to go to to find materials and methods. Other websites such as Open Hardware and Thingiverse share files for the emergent and growing practices of 3D printing and other forms of machine-tooled and 3-dimensional object making. While tangible meeting and working sites, Fabrication Laboratories (or FabLabs), such as Proto-Space (Utrecht, Netherlands) and Open Design City (Berlin) as well as Hackspaces such as c-base (Berlin) have made a significant change in the availability of access to machines such as 3D printers, laser cutters, and contact with a community of technical and computational experts. Of course, festivals, fairs and events such as MakerFaire, SIGGRAPH, SXSW, Transmediale (Berlin), FutureEverything (Manchester) and ISEA provide great opportunities to share knowledge, skills, and meet the actors involved in the global shift of sharing design expertise.

OPEN DESIGN IS ABOUT COMMUNICATION.

Open Design is about communication—it is a practice heavily reliant on documentation—video, photo, illustrations etc.—and the vulgarization of technical language leading to the simplification or elimination of specialized jargon. It is important that design concepts and methods be easily understood, communicated, modified and shared across platforms and knowledge bases. Without the ability to communicate practices, Open Design would perish. Open Design is about community, hence it is about the accessibility of information, knowledge, practice, tips, and knowhow—which would be impossible without shared language. It is about creating interactive relationships between makers, designers, and technicians, which can be interpreted over a broad range of experience and interests. Think of Open Design as a communal soup, which is expanded, modified, corrected, and enhanced over time—but always accessible. As long as we can follow the tread / information / instructions we can all participate.

OPEN DESIGN IS ABOUT SOCIAL ADAPTATION.

Open Design is about social adaptation—it invites initiated and uninitiated users to reproduce, modify, improve, customize—and be inspired by others and their work. It is about co-creation, and 'personal design nodes' where the shape and making of design can be seamlessly personalized, and adapted to use, whimsy, or even unforeseen practical solutions. It is both about the personal and the collective in as much as it solicits input from individuals for their needs and desires while also keeping the practice and knowledge open-ended enough for collective contributions and specializations over time. Works such as Nervous System's user-generated, nature inspired jewelry propose new and exciting design collaborations where the results unexpectedly unfold. Open Design stresses for adaptability on the material front (easily modified techniques and technologies) and the social front (easily personalized, accessed and interpreted designs) in order for it to remain conversant with future designers. Open Design is a future forward practice, which factors in social adaptation for processual design iterations.

OPEN DESIGN IS FREE!

Open Design is free—because making it free permits it to travel far and wide, gain exposure, be critiqued, improved through stylistic as well as technical corrections, additions and modifications, pushing the discipline forward. And if others give it away, so can you. It does not mean that you cannot make things, sell them, or get paid for what you do—but rather that key information, practices, and materials that contribute to the making are either distributed or rendered physically accessible for free in a belief that, sharing makes for better design, and better communities. An example of this economy of Open Design is Ronen Kadushin's Hack Chair, wherein the designer made all of the chair's DXF files available for download, copying, re-use, and interpretation. The only parameter implemented was that if a new iteration of the Hack Chair was marketed and sold, profits would shared with the original designer. The Hack Chair and its concept has led to a series of exciting and unscripted design iterations, collaborations, and exhibitions for Ronen Kadushin. This 'free' practice is predicated on the Creative Commons structure, which also allows for a spectrum of copyright attributions and uses which can be adapted to different production and cultural artifact contexts.

What can Open Design do for wearables?

UNZIPPING WEARABLES

Open Design for wearables democratizes and 'unzips' the practice, making it more accessible from a variety of angles, needs, technologies and visions. Wearables is a wide ranging practice as it stand, combining engineering, fashion design, craft and technical production methods as well as artistic expressiveness and computational know-how. With such a variety of input points and expertise angles, Open Design serves wearables by making the divergent axis communicate with one another, share knowledge, skip over technical jargon and schematics and create a platform that is richly and widely interpretive for many users and many uses.

SITES OF OPEN DESIGN IN WEARABLES

Sites specializing in e-textiles such as How To Get What You Want run by Mika Satomi and Hannah Perner-Wilson are a wealth of information on techniques for creating soft circuit designs while publication such as Fashioning Technology by Syuzi Pakhchyan (which now runs as a wearables blog and networking site) give numerous concrete examples are 'recipes' to create your own D-I-Y electronic garment or object. The recent Open Softwear publication on which Melissa Coleman collaborated also expands on the technical practice of wearables by untangling information around its production. Finally, real meeting points such Otto von Busch's Hacking Couture workshops and the E-Textile Workspace run by Piem Wirtz and Melissa Coleman at V2_ Institute for the Unstable Media (Rotterdam) give an interested or active public a forum to share information and get tips on practical issues, and conceptual developments in the field of wearables.

All of these sites, publications, and locations dedicated to wearables operate on limited or no funds, and are in principal free (or almost free) of access. Though perhaps not self identified as Open Design, they are certainly conceptually and practically oriented towards it. What is more, they seamlessly converge with and contribute to Open Design websites, spaces and practices previously mentioned, adding to the distributed network of knowledge and practices.

TRANSFORMATION OF WEARABLES VIA OPEN DESIGN

What we see with this increase in access to knowledge, spaces, technologies and practices is a professionalization of the wearables field. Previously craft or technical-only niche groups are becoming increasingly conversant with one another. Access to high-tech tools and experts are 'industrializing' the practice giving designers more options to professionalize their craft through custom circuits, 3D printing, laser cutting etc. The technical networks, both tangible and conceptual, help shape this hybridization of the wearables field by giving designers access to specialized knowledge and tools, resulting the expansion of their material repertoire and craft expressiveness. Fashion designers such as Pauline van Dongen have collaborated with 3D printing company Freedom of Creation to create 3D printed shoes, while Anouk Wipprecht has collaborated with wearable art labs such as V2_ to develop interactive garments. Meanwhile, Moon Berlin, a fashion label exploiting light in their designs, has combined the best of fashion with the best of technology by collaborating with the Fraunhofer IZM and incorporating their state-of-the-art stretchable circuits. All of these wearable designers are tapping into expertise and tools which are distributed in an increasingly open and free spirit.

The results of this open exchange is the emergence of an increasingly high-tech, hybrid, networked cottage industry in which fashion knowhow and electronics innovation are being merged in a professional yet highly democratic fashion culture and community. Though the overlaps come from at times divergent technical and artistic fields as well as economies, the push is, as noted in the Creative Common's recent anthology of interviews 'The Power of Open,' a solid argument for "sharing becoming a default standard". This is a revolutionary moment for the making of wearables and 3D objects, similar to that which occurred in the 2D world of desktop publishing in 1985, which we should embrace, share, contribute to and protect via Open Design philosophies and practices.

Open Design + 3lectromode

DEMOCRATIZED, AESTHETICIZED, AND PERFORMATIVE

I want to take this opportunity to speak about my own involvement in Open Design, via the 3lectromode platform. 3lectromode holds the vision of innovating in the field of wearables by combining technology with customizable prêt-a-porter fashion. We aim to inspire a future where wearables are democratized, aestheticized, and performative. We are a small design group interested in developing accessible wearables which combine D-I-Y technology with current fashion research. We are fascinated with the potential for technology to create new modalities of interaction between the body and its environment, and are interested in the performative potential of technology.

OPEN KITS + USER-INPUT

Key to 3lectromode's design ethos is a to create a library of open sourced fashion designs which can be easily assembled as kits by anyone with an interest in wearables, electronics or fashion. The kits come complete with the printed garment, necessary electronics and instructions, taking the guesswork out of electronics assembly while permitting the user to create a customized and fashionable design.

Designs are printed on textile printers on which also include the layout of electronic schematics and sewing directions. The methods for assembling the electronic components of the wearable are integrated into the design and can be visually followed much like a painting by numbers, without interpretation or recourse to manuals. Each piece is uniquely designed, and comes with customizable options for different print patterns, colours, models, and sizes - giving the user-end designer agency in creating his or her own iteration. Computational variations are also included to modify LilyPad Arduino program. So far, the designs with 3lectromode have focused on integration of LEDs with various sensors, utilizing the LilyPad Arduino platform for electronic components and programming.

3lectromode's kits are the perfect entry point into wearable technology because of their graphic visualization of electronics assembly methods, while also creating a uniquely stylish and fashionable garments. In the process of testing out this Open Design platform, we at 3lectromode have been interested in integrating feedback from the user-end designers and welcoming collaborations on the sharing of techniques, designs and applications. Ultimately, while keeping a stylistic curatorial vision true to 3lectromode, we are interested in seeing how people might hack and interpret our work in an Open Design fashion.

References and Notes:

1. *Bas van Abel, Lucas Evers, Roel Klaasen, and Peter Troxler, Open Design Now: Why design cannot remain exclusive (Amsterdam: BIS Publishers, 2011).*
2. *Neil Gershenfeld, FAB: The coming revolution on your desktop—from personal computers to personal fabrication (Cambridge MA, Basic Books, 2005).*