Design Thinking Through Understanding People

Timeline Friday 20 February

Dan Lockton, PhD Carnegie Mellon School of Design @danlockton



Design Thinking Through (trying to) Understand People

Timeline Friday 20 February

Dan Lockton, PhD Carnegie Mellon School of Design @danlockton



★ The idea of imaginaries

- **★** Design for behavior change
- Examples around energy use
- Different kinds of understanding
- New opportunities for using design

Activity: Two kinds of understanding



Royal College of Art, London

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PEL 170G

imaginaries lab

imaginari.es





Sign up for Pittsburghing!

Join us for a design workshop for civic engagement









Silvia Mata-Marin (PhD) Delanie Ricketts (MA) Nehal Vora (MPS) Theora Kvitka (MA) Ashlesha Dhotey (MDes) Sarah Foley (MDes) Dan Lockton

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We're using design methods to explore and support people's imagining:

– new ways to understand
– new ways to live

imaginaries

metaphors narratives stories simple cause & effect links myths paradigms folk theories

'If men define situations as real, they are real in their consequences'

William Thomas & Dorothy Swaine Thomas The Child In America, 1928

people often act on imaginaries

people often act on their model of the situation

people often act on their model of the situation

(designers know this)

Two Theories of Home Heat Control*

WILLETT KEMPTON

Michigan State University

People routinely develop their own theories to explain the world around them. These theories can be useful even when they contradict conventional technical wisdom. Based on in-depth interviews about home heating and thermostat setting behavior, the present study presents two theories people use to understand and adjust their thermostats. The two theories are here called the feedback theory and the valve theory. The valve theory is inconsistent with engineering knowledge, but is estimated to be held by 25% to 50% of Americans. Predictions of each of the theories are compared with the operations normally performed in home heat control. This comparison suggests that the valve theory may be highly functional in normal day-to-day use. Further data is needed on the ways this theory guides behavior in natural environments.

Human beings strive to connect related phenomena and make sense of the world. In so doing, they create what I would call folk theory. The word "folk" signifies both that these theories are shared by a social group, and that they are acquired from everyday experience or social interaction. To call it "theory" is to assert that it uses abstractions, which apply to many analogous situations, enable predictions, and guide behavior. I would con-

 This paper will also appear as a chapter in Cultural Model in Language and Thought, N. Quinn and D. Holland (Eds.), Cambridge University Press, 1985. Copyright for this paper is held by Cambridge University Press.





SIEMENS

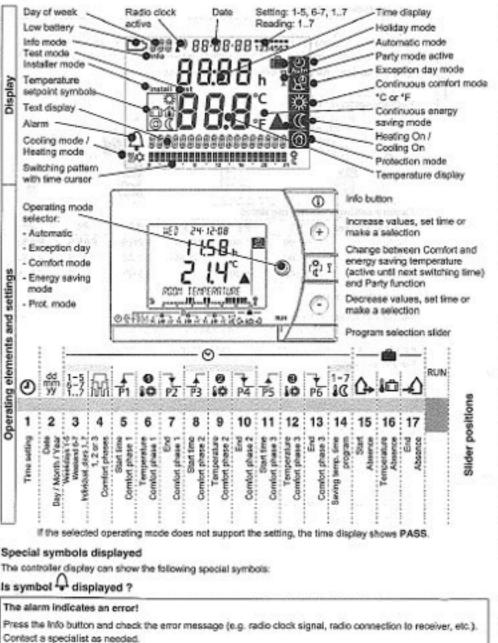
Operating instructions

REV24RF... - 7-day radio room temperature controller for the right temperature at the right time. All factory settings already provide optimal living comfort. You can easily adjust the controller to your needs with the userassisted clear-text display and program selection slider.

REV24RF.. (controller with radio transmitter) is a wireless device that you can mount on the wall or place freely on a base in the room.

Its radio frequency 868 MHz is largely immune to external disturbances. The signal level meets regulations and is kept as low as possible. The devices are approved for all EU member states, loeland, Norway, and Switzerland.

- Note the following for placing the devices:
- Make sure no other influencing factors influence the controller's temperature sensor (no solar radiation and other heat or cold source influences).
- The distance between controller and receiver may not exceed 20 m or 2 floors.
- Do not place near metallic items or electrical devices, etc..



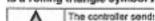
Is symbol 12 or O displayed?

The controller is in "heating mode" 🎬 or "cooling mode" 🔯 .

Is a rolling triangle symbol /

REV24RF..

RCR10/868



Is symbol D displayed ?

This symbol tells you that you months.

Insert 2 new alkaline batteries typ Remove the controller from the m rear; remove the old batteries; int the base.

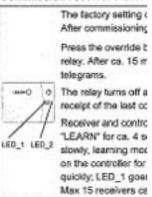
Caution: Time and date are (All other settings ri

Dispose of the batteries as per re

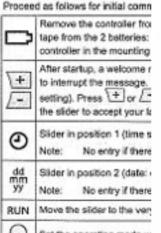
Is symbol 🖉 displayed ?

The radio clock symbol only apper time signal from Frankfurt (Germa date of the controllier are synchror The symbol flashes if the signal is

Commission receiver RCR16



Commission the controller a The controller contains a factory-s



Set the operating mode w Fold the operating instructions and

Tips to save energy without

- · Heat your rooms to max 21 °C.
- Use to switch to energy sa
- Air out your rooms briefly, but y

25.12.2007 Image: Dr Nicola Combe



82206en

'When we don't know how a thing works, we make it up'

Louise Downe, Head of Design, UK Government Digital Service

We can only trust something if we think we know how it Works

Louise Downe, Head of Design, UK Government Digital Service climate change resources social equity quality of life public health

artificial intelligence automation algorithmic decisionmaking & profiling social media 'the Internet'

Some themes in Imaginaries & design

Design for behavior change

Some themes in Imaginaries & design

Design for behavior change
Image Image

Some themes in Imaginaries & design

Design for behavior change
 energy

 understanding
 mental models & mental imagery

Design for behavior change

Behavioral Design

Design for sustainable behavior







ivered cash

Real time energy use

165 kg CO2 per hour

111

See more on CarbonCulture Submit feedback

nt Efficiency

08 Aug 2011

Real-time Energy Use

We are now using £36.26 cost per hour

About our energy use

latest photos



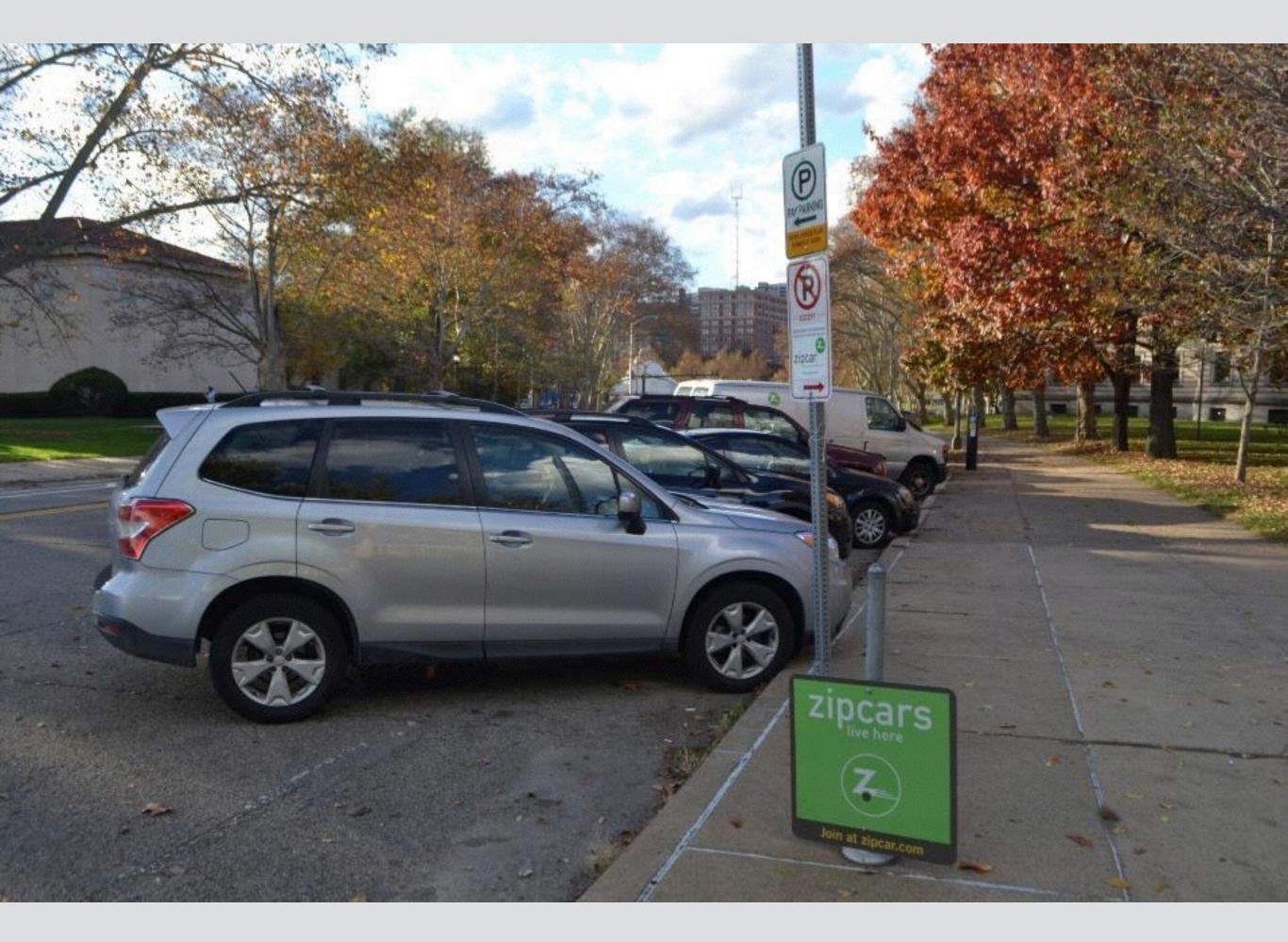


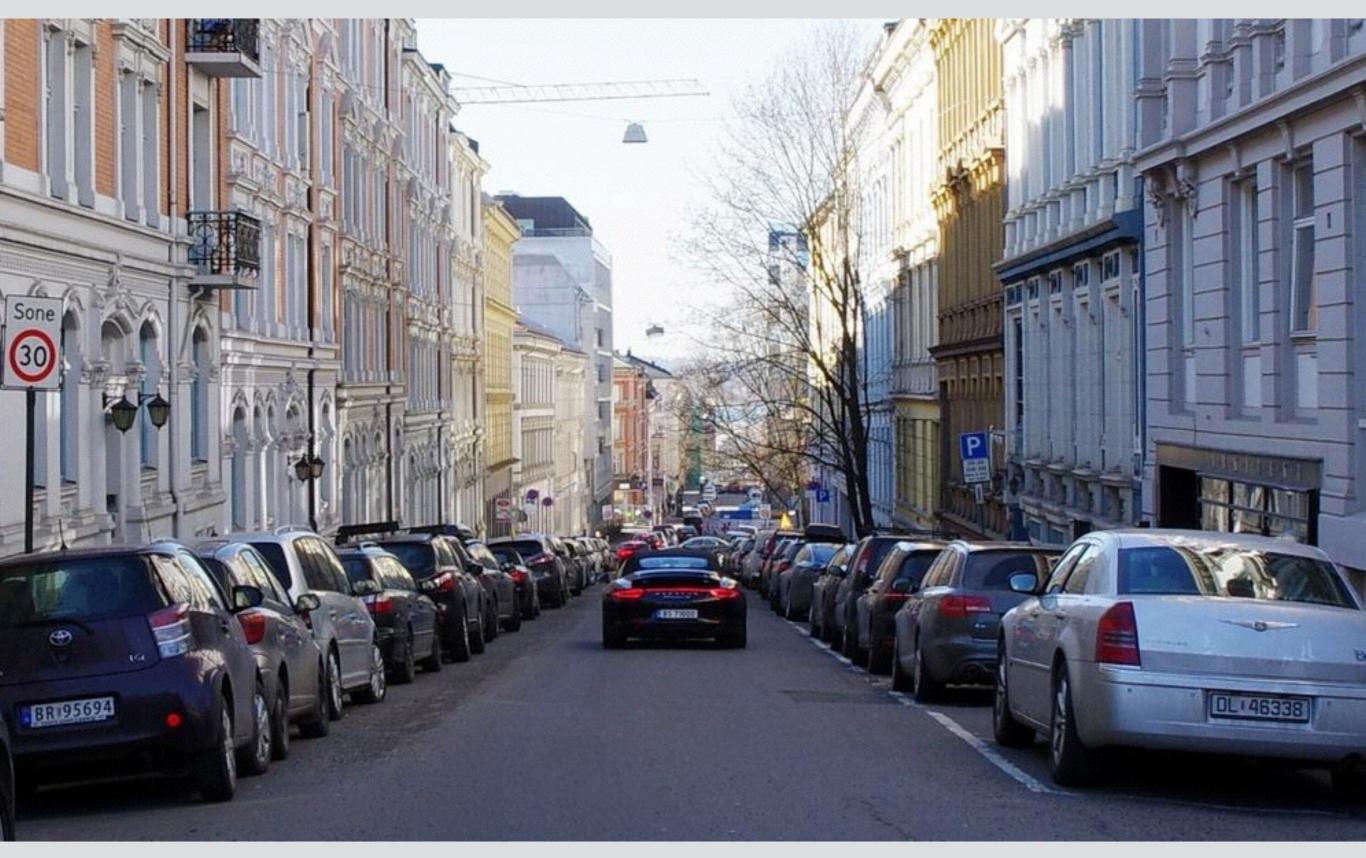
follow us on faceboo



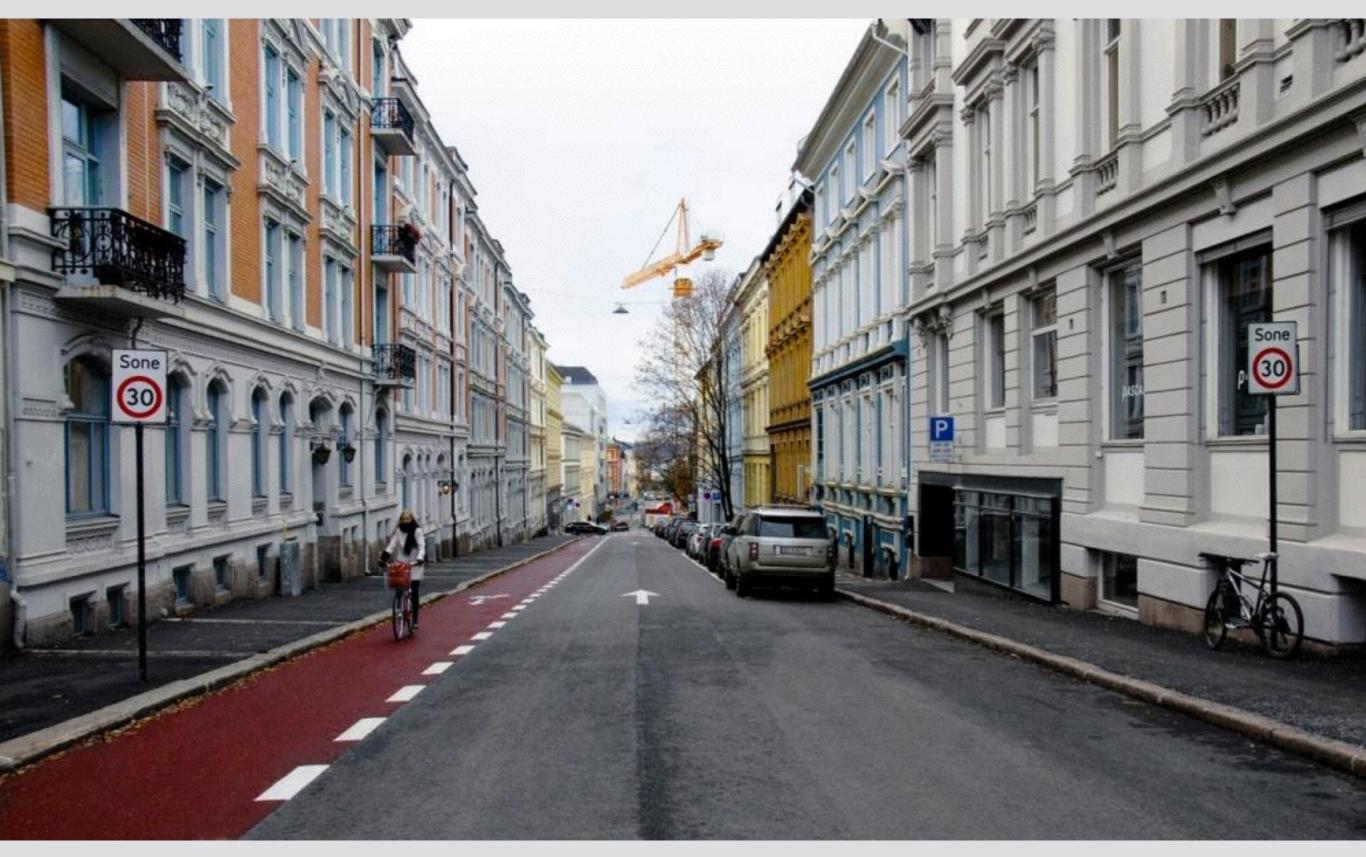








Oslo, Norway. Photo: The Guardian



Oslo, Norway. Photo: The Guardian





Image: OPEN Rotterdam



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Amazon Dash Button

Amazon Dash Button makes ordering easy. With a simple click, Prime Members can order their favorite products.



Buy Dash Button for \$4.99, and receive a credit for \$4.99 after your first press to place an order



Read images-na.ssl-images-amazon.com

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WHAT IS DASH BUTTON?

Amazon Dash Button is a Wi-Fi connected device that reorders your favorite product with the press of a button. Each Dash Button is paired with a product of your choice, which is selected during the set-up process. When you're running low, simply press Dash Button—ensuring you never run out of your essentials again.

SIMPLE TO SET UP AND USE

Dash Button is set up and managed through the Amazon App on your Android or iOS smartphone, and works in any location with a Wi-Fi connection. Once set-up is complete, a notification (if enabled) is sent to your smartphone every time an order is placed. <u>Click here</u> to make sure you have the latest version of the Amazon App.

ORDER PROTECTION

With this setting, Dash Button will not place a new order until your prior order is delivered—regardless of how many times Dash Button is pressed. In addition, you will receive an order notification (if enabled) for every order placed. You may cancel orders at any time before they are marked as "Shipping Soon". Visit <u>Your Orders</u> on Amazon.com or the Amazon shopping app to review the status of your Dash Button orders, which will appear alongside your other Amazon.com orders.

\$4.99 CREDIT AFTER FIRST PRESS

Buy Dash Button for \$4.99, and receive a credit for \$4.99 after your first press. See terms and conditions

EXCLUSIVELY FOR PRIME MEMBERS

Dash Button is available for Prime members only. <u>Click here</u> to learn more about Prime.

Ding Ding / CORY DOCTOROW / 9:08 AM TUE FEB 7, 2017

Make: a \$5 ACLU-donation Dash button you can press every time Trump makes you angry



Nathan writes, "Wanting a more immediate and responsive way to do something about the outrage a friend and I felt every time we read about the latest assaults on civil liberties, I built an Amazon Dash button that sends \$5 to the ACLU every time I press it. Repurposing the technology to do good, not just buy goods."

Nathan had to kludge a way to auto-submit the ACLU's donation form, making this a little tricky to repurpose to give to other orgs (e.g. EFF, Southern Poverty Law Center, Council on American Islamic Relations).

FROM THE BOING BOING SHOP



The Complete Web Developer Course: Build 14 Websites





(i) a https://dublin.sciencegallery.com/designandviolence/exhibits/camden-bench.html



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Camden

NIOLENCE EXHIBITS CURATORS ESSAYS ABOUT **EVENTS** ADVICE VISIT PRESS BLOG SHOP

DESIGN

SCIENCE GALLERY

14.10.16-22.01.17

TUE-FRI 12:00-20:00 SAT-SUN 12:00-18:00

MoMA

A CO-PRODUCTION BY THE MUSEUM OF MODERN ART, NEW YORK, AND SCIENCE GALLERY DUBLIN

AK-47 DO HIT CHAIR SERPENTINE RAMP EVERY ANVIL BLOCKCHAIN **BITCOIN MINER** BRUISE HALDEN PRISON 6X9 ZIP-TIE HANDCUFFS TASER IR8 MIRACLE RICE STUXNET: ANATOMY OF A COMPUTER VIRUS SOLITARY CONFINEMENT GREEN BULLETS KENT SPIKE STUDS CAMDEN BENCH AK47 VS M16 WHITE TORTURE BOMB CLOUD ATLAS DRONE SHADOWS DRONE SURVIVAL GUIDE SEMANTIC VIOLENCE WALL LIBERATOR HACKED PROTEST OBJECTS MOSQUITO SPECULUM EIGHTH AMENDMENT REPEAL JUMPER THANATRON LOCKBOX FLECHETTES FGM AWARENESS POSTERS WALKING LIPS HUMANAE DIGNITIES PERMANENT ERROR THE ULTIMATE PINT DIGNITAS BROCHURE DO NOT RESUSCITATE ADE651 ANKLE MONITOR PALISADE FENCING **FP-45 LIBERATOR** ZIP GUN SPANK ME PLEASE SPANKING RULER GUY FAWKES MASK \$2 DRUG TEST G4S BADGE **BURNING CAR** SERIOUS GAMES 1: WATSON IS DOWN HOW TO KILL PEOPLE THE WEIGHT OF WATER ANTIPERSONNEL

UNTITLED (2 REMOTE-CONTROLLED

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CAMDEN BENCH Factory Furniture, 2012 Monolithic determination of use

The Camden Bench is a piece of concrete street furniture weighing almost two tonnes. It was commissioned by the Camden Borough Council and designed by Factory Furniture for use in the north London neighbourhood to deter unwanted behaviours. According to its creators, the bench is designed "to resist criminal and antisocial behaviour". It deters rough sleeping as its ridged top and sloped surfaces make it difficult to lie on. Drug dealing is made difficult, as without crevices there is no place to hide contraband, while shallow recesses along the bench's front and back allow people to store their bags temporarily behind their legs for security. Cleaning and maintenance is reduced as there are no flat surfaces or crevices where litter can accumulate, and the bench is designed so that dirt and water flow off. It has received both design awards and criticism, been included in an art



Every piece of technology 'encodes a hypothesis about human behavior'

Adam Greenfield, Against the Smart City, 2013

'design designs' (Tony Fry)

'we design our world, while our world acts back on us and designs us' (Anne-Marie Willis) Many different areas (and traditions) of psychology Sociology, science & technology studies Ethnography, cognitive anthropology Architectural theory Human-computer interaction Ergonomics and human factors Decision science, behavioural economics Cybernetics

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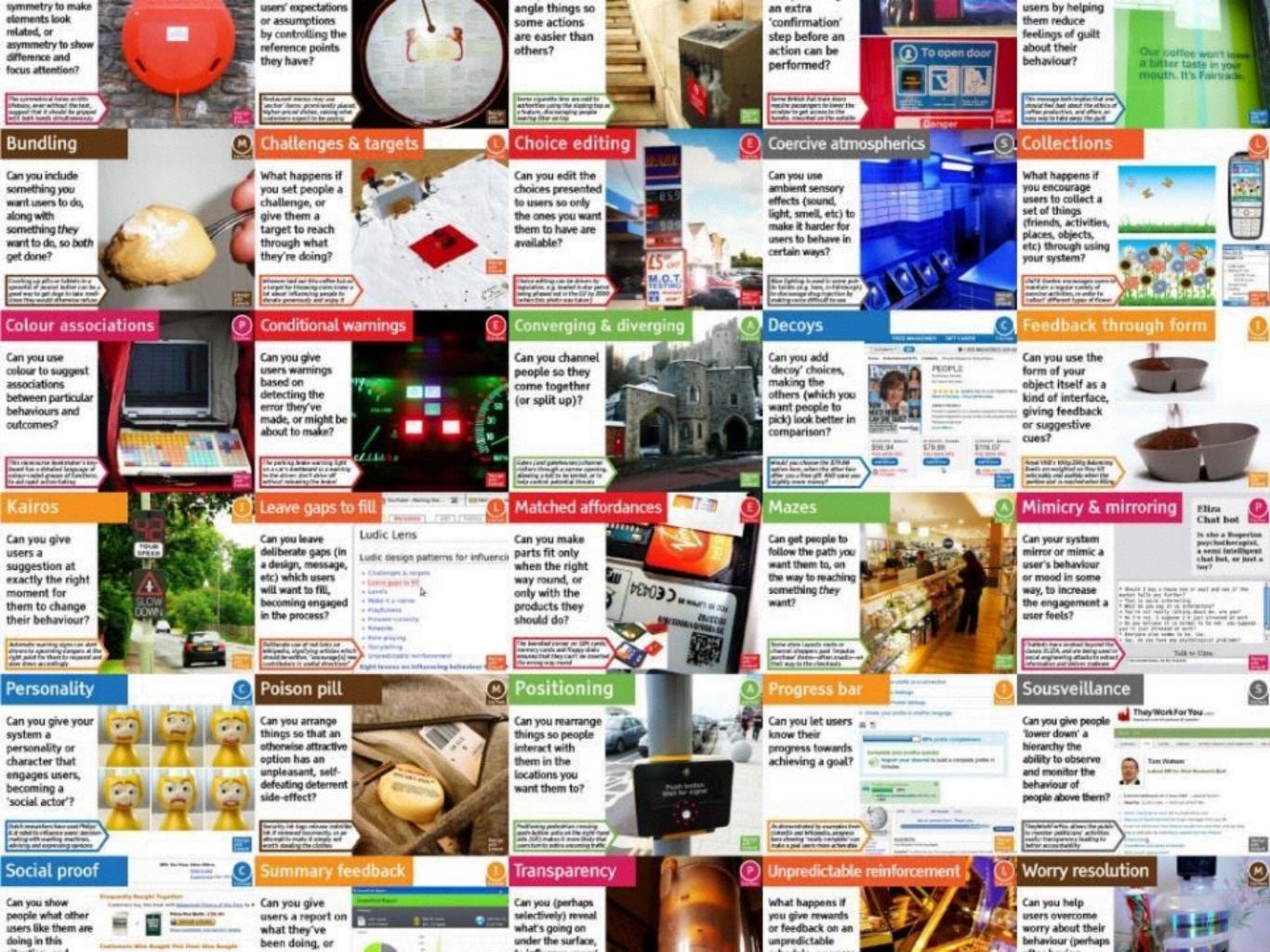












designwithintent.co.uk

oximity & groupin

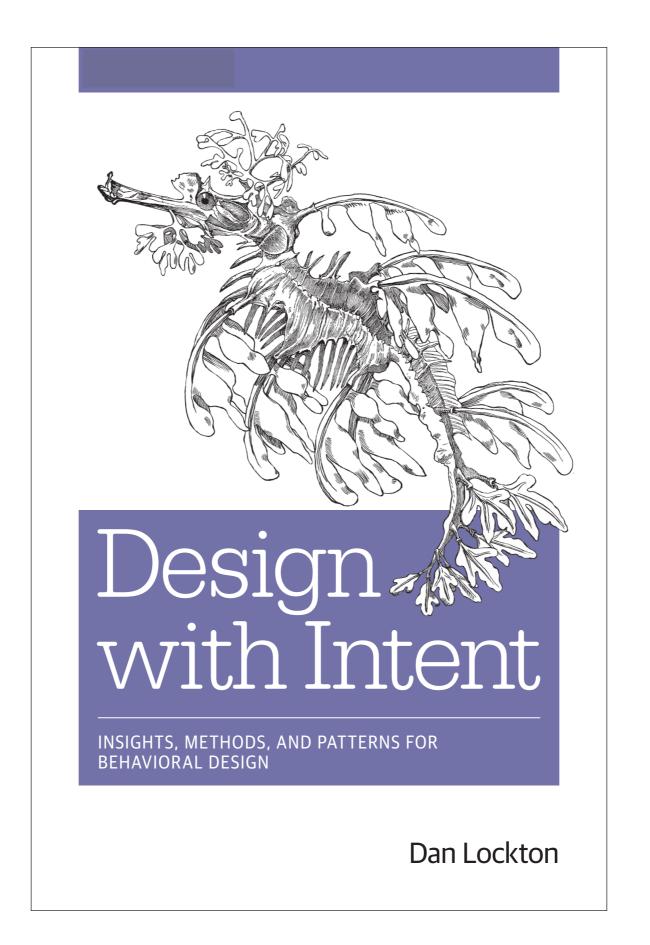
Design with

101 patterns for influencing behaviour through design

Intent

Design with Intent toolkit

A cross-disciplinary design pattern library for behaviour change with products, services and environments; developed through workshops with industry and academia





Atomata-Obsolescência funci-Div Reciprocidade Proeminência Design com Intento Você pod Ângulos usuários que rece favor (p ou por usuárie querer 101 padrões para influenciar comportamentos através do design ó e) Estes C gratis buição Requisite Variety 01 20550 con Dan Lockton No para David Harrison & Neville A. Stanton Tradução: Luis Oliveira

Rozdělení a vzdálenost

Je možné nějaký systém rozebrat aby lidé ovládali pouze jeden prvek naráz

Tyhle individuální sedačky nahrazují lavičky v Pařížském metru, umístěny jsou tak aby na nich nemohl nikdo polehávat nebo zabírat více jak jednu

20 × 28 × 29 août 2008 BOULOGNE - PONT DE SAINT-CLOUD **** Design with Intent

Translation by Jan Laky

Segmentación

¿Puede la forma de un objeto hacer que lo usen cierto numero de personas?





En el metro, los asientos están colocados en una misma línea pero la forma que tienen solamente le permite a una persona el utilizarlo y distribuirse de mejor forma.

Version by Nora Morales Zaragoza, UAM

energy use and sustainability



WMG, University of Warwick, Coventry, UK

Royal College of Art, London

NUMBER OF STREET



Research Projects

Research Spaces

PhD Programme

Student Programme

Knowledge Exchange

Executive Education: Masterclasses & Workshops

External Education

About



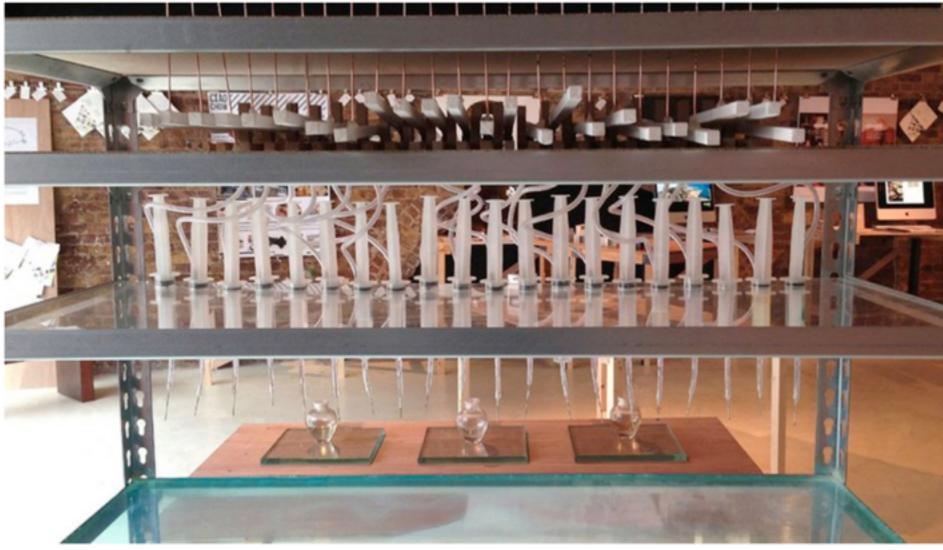
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The Helen Hamlyn Centre for Design at the Royal College of Art undertakes design research and projects with industry that will contribute to improving people's lives

Helen Hamlyn Centre for Design



Innovation Design Engineering Research



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Innovation Design Engineering (IDE) has been offering doctoral research degrees since 1985 and traces its history and connections back to Bruce Archer's Industrial Design (Engineering) research unit formed in the mid 1960s. Archer received his RCA PhD in 1965 and went on to become one of the leading design researchers of his day, with ideas and influences that continue to gain interest.

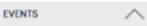
IDE research interests cover a wide range of domains and topics, from the industrial through to the conceptual and theoretical. We encourage research in design thinking, design practice, experimentation, exploration of new materials and cutting edge technologies, interdisciplinarity and the application of new design methods within the expansive remit of innovation.

Although IDE receases avantics is currently focused on a practice, based approach, we will

CONTACT

design-research@rca.ac.uk

"Staff are engaged in a broad range of activities in a wide actively integrate them across



13 June LDoc Keynote Lecture: Paul Chamberlain and Stuart Walker PUBLIC

15 June - 16 June Intimaterial PUBLIC

15 June Fine Art Talk: Sitraka Rakotoniaina PUBLIC

EU Students:

EU students applying to English universities in autumn 2018 will benefit from the current system of postgraduate loans and pay the same fees as UK students, for the duration of their programme.

Design Products Research

Service Design

range of design Innovation Design Engineering

the recearch and mactors





supported by Technology Strategy Board Driving Innovation

CarbonCulture at DECC

Can user engagement save energy and carbon at work?

An exploration of behavioural economics at the Department of Energy and Climate Change





Tate Modern

home about blog feedback login

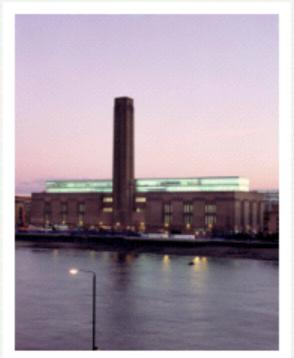


About this building

Tate Modern is the home of Tate's collection of international modern and contemporary art. Formerly Bankside Power Station, designed by Sir Giles Gilbert Scott and built in two phases between 1947 and 1963, Tate's transformation of the Power Station began in 1995. A steel framework was built within the existing walls of the Power Station to create the seven gallery floors. This framework also supports the existing brick façade of the building. The architects were Herzog & De Meuron. Since it opened in May 2000, more than 40 million people have visited Tate Modern.



Our energy use



Tate Modern

[Design Approaches t...

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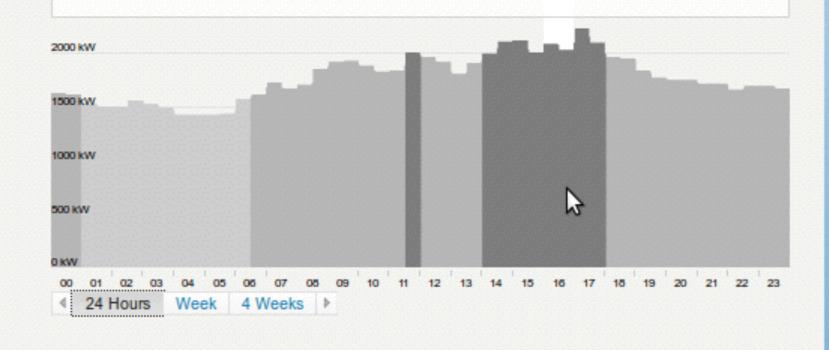
This graph allows everyone to access a range of data from Tate Modern. It's generated daily from data collected every half hour from the on-site meters.

SIL

[Sun VirtualBox]

For the hour commencing 16:00 on 5 Sep, Tate Modern has used:

2,044kWh Energy use Average 2,044kWh per hour £163 Energy cost Average £163 per hour 1,072kg Carbon impact Average 1,072kg per hour



0



The 11 partners in SusLabNWE

Locations

Research for SusLab is carried out in: Rotterdam, London, Goteborg and Nordrhein-Westfalen



SusLab Partners

The SusLab platform is constructed between 11 partners in four North West European countries.

🗴 in

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Delft University of Technology (TU Delft)

Chalmers TH

Innovation City Ruhr

Institute for Sustainability

Imperial College London

Hochschule Ruhr-West

CityPorts Academy

Johanneberg Science Park

Royal College of Art

Woonbron

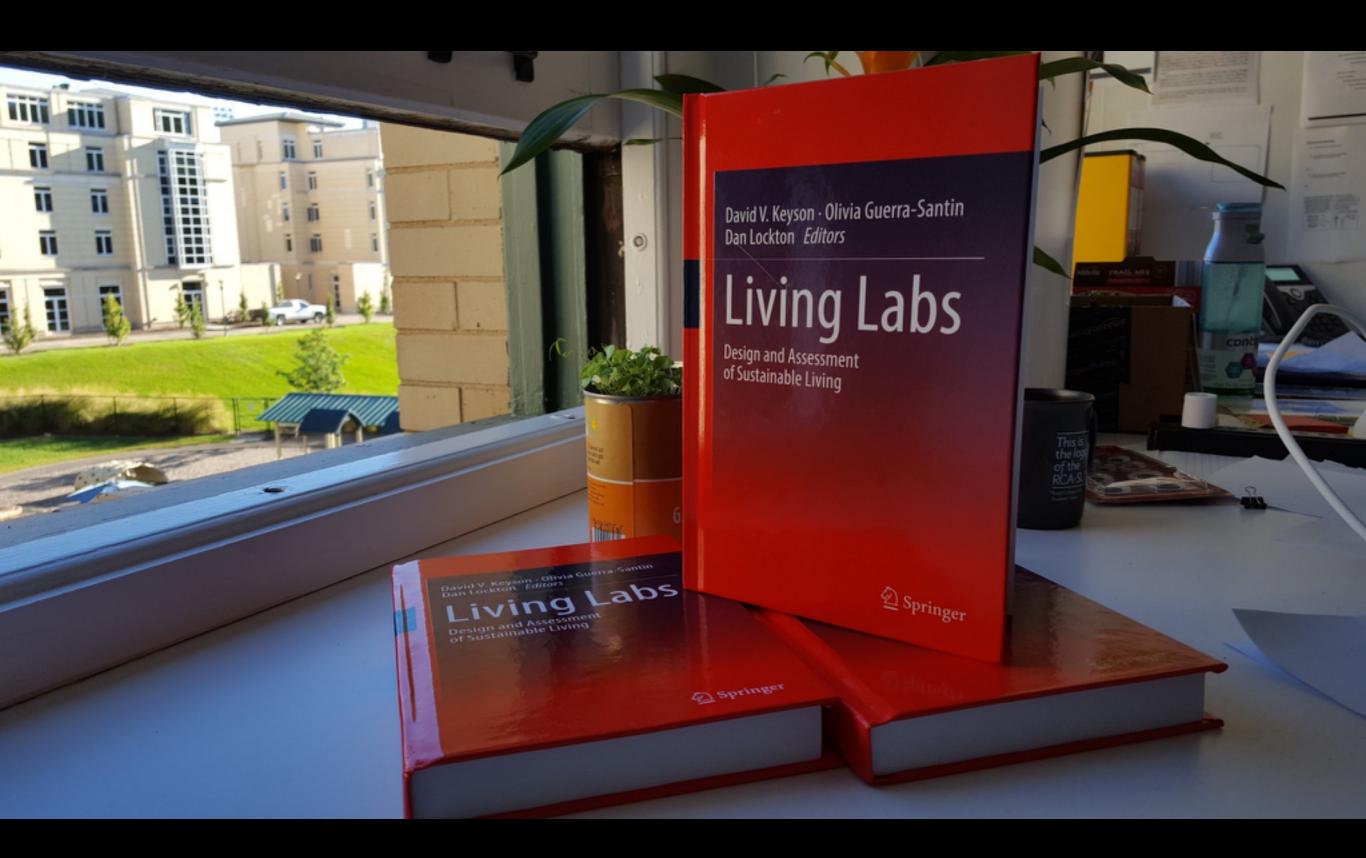
Wuppertal Institute

Partner log-in











Designing with people

rather than for people

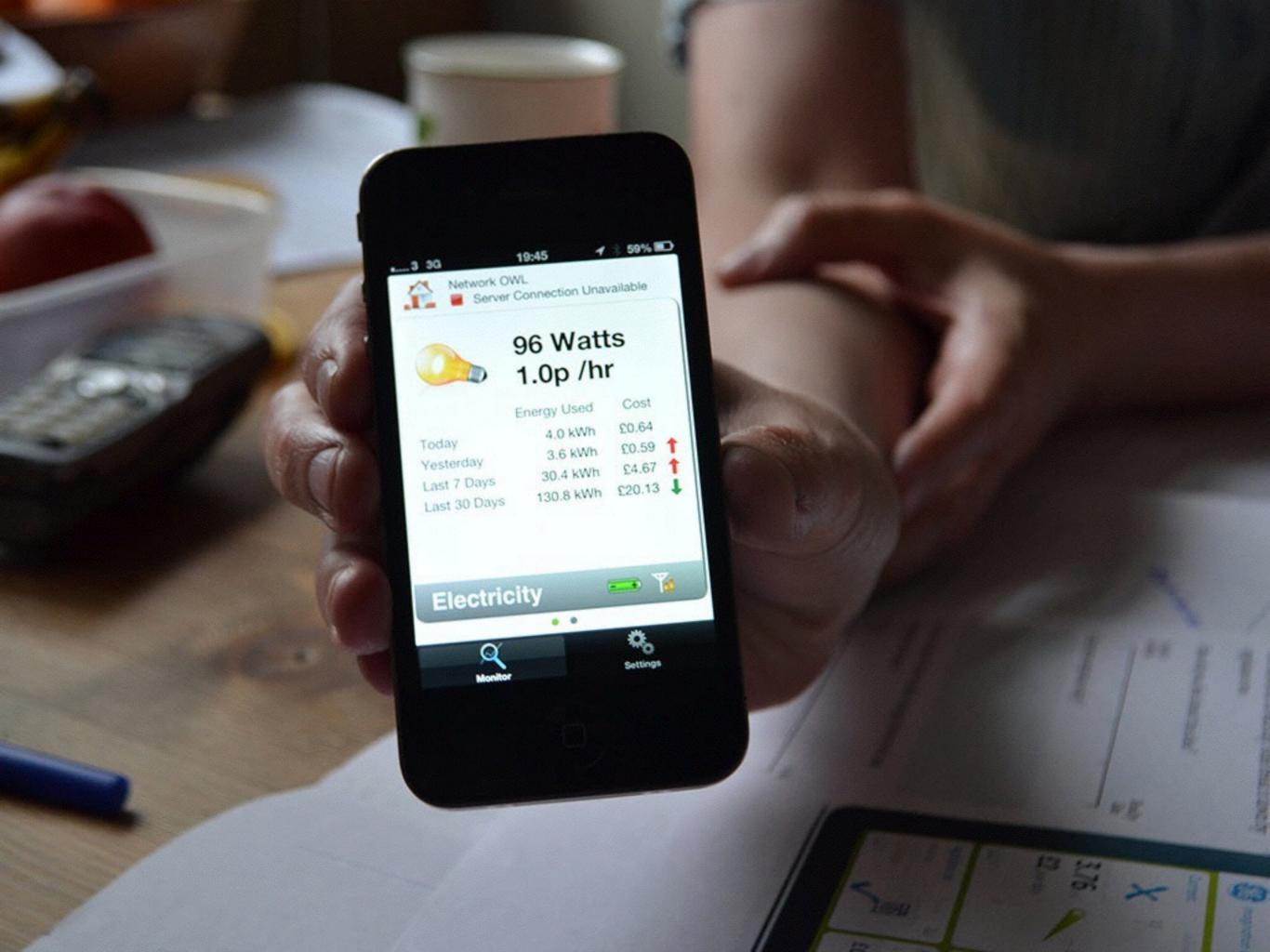
participatory design co-design

And that means understanding people's lives: Understanding the contexts and the nuances of everyday experience, and people's interactions with the world Yes, this is lightweight ethnography: make use of more detailed research where it exists, but there is value in experiencing people's worlds yourself – particularly if you're looking for something that hasn't been thought about before

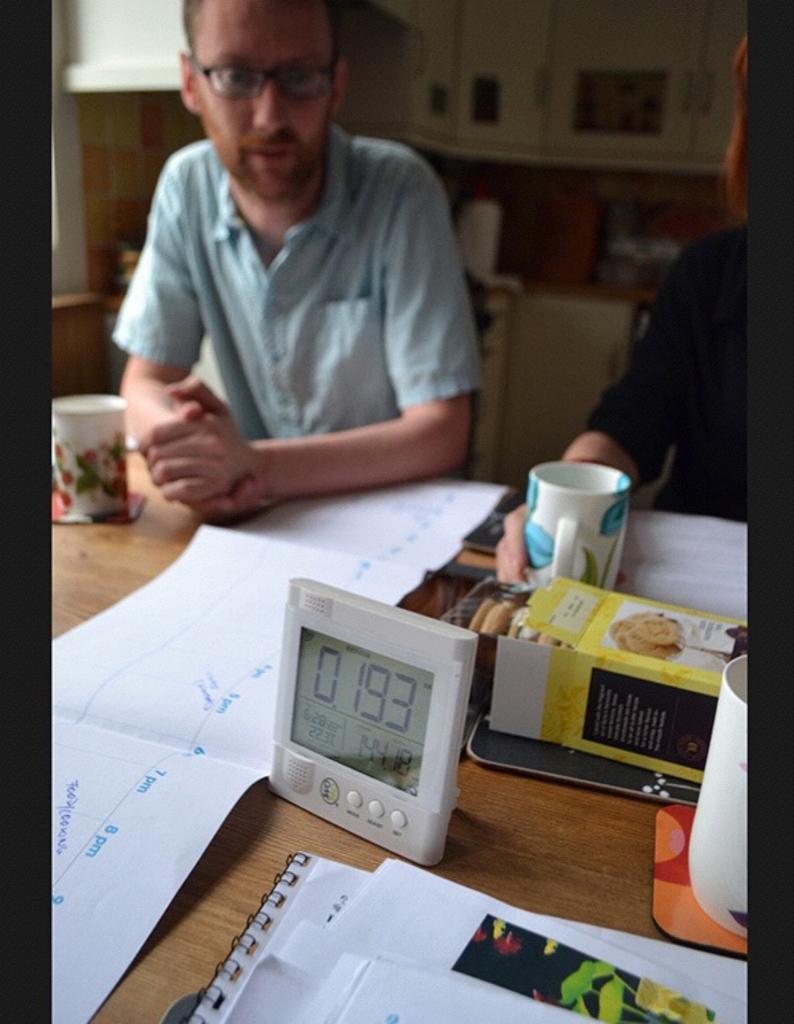






















developed by Natalia Romero Herrera, TU Delft

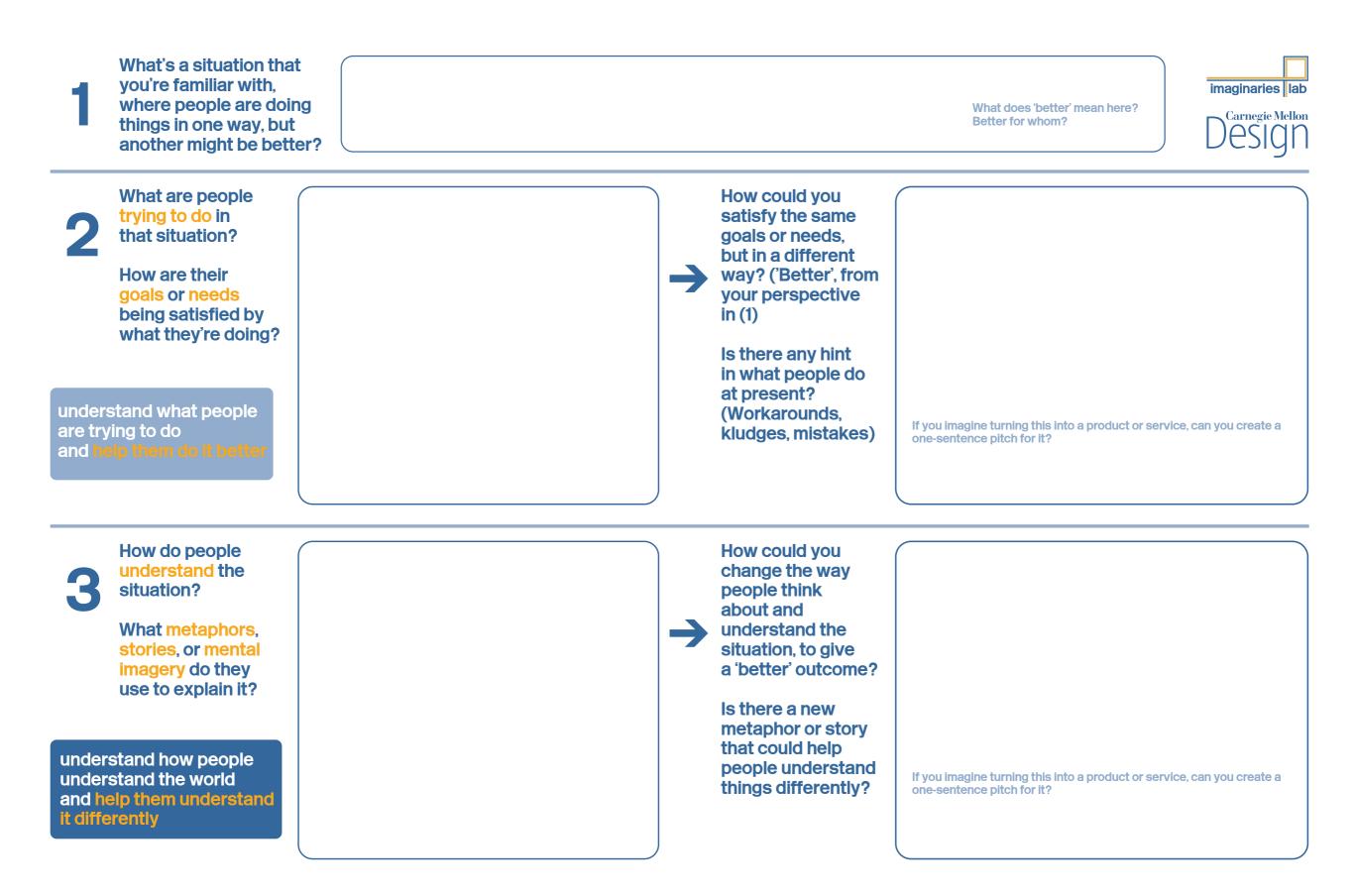
Timeline Friday 20 February

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Mode U6 ngland Gas meter can't read it without going outside



Two ways of doing this: 1) Understanding what people are trying to do, and helping them do it better Two ways of doing this: 2) Understanding how people understand the world, and helping them understand it differently

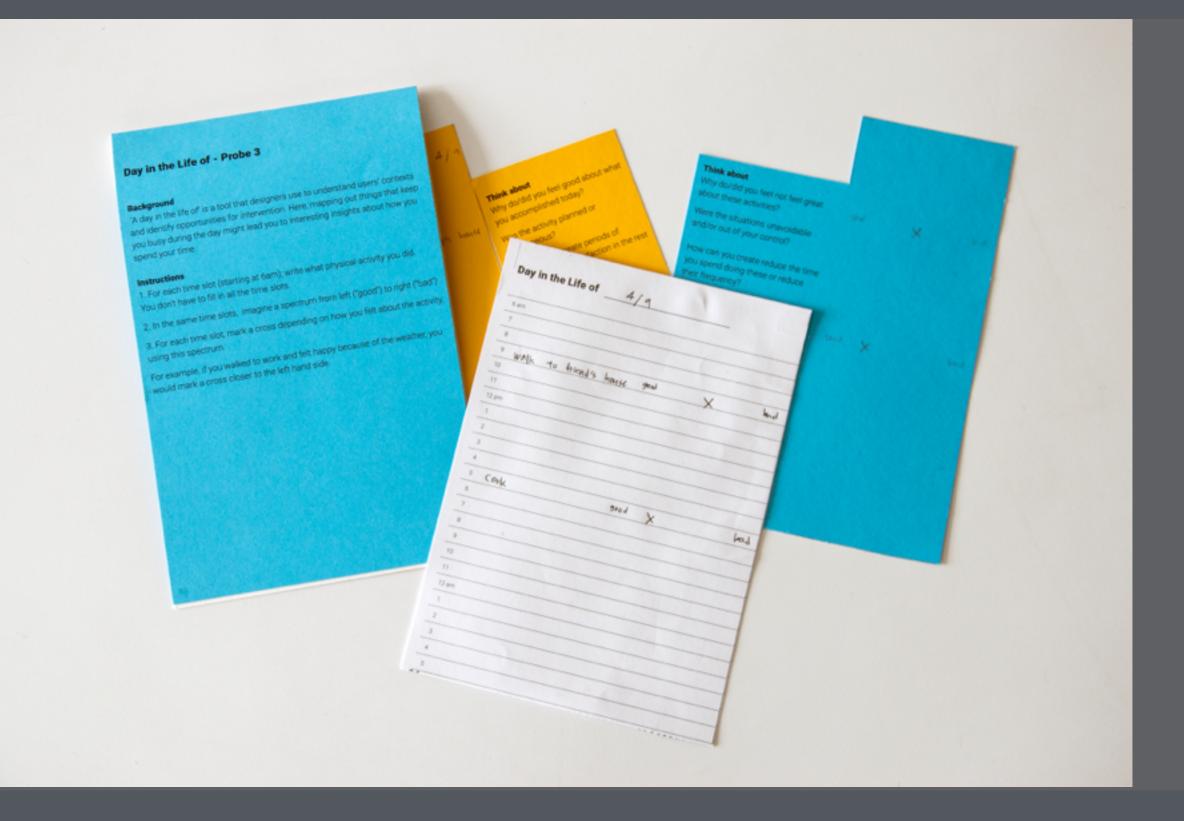


Two ways of doing this: 1) Understanding what people are trying to do, and helping them do it better

Design for behavior change around fitness







Dear data - Probe 4

Background Gorgia Lupi and Stefanie Posavec worked on a project called "Dear data". They hand drew their "data" from various aspects to their lives for 52 weeks and shared it with each other, through postcards, across continents. The experience made them "become more humane and (helped them) The experience made them and others at a deeper level".

Instructions

1. Take a screenshot of your "quantitative" fitness data as recorded by your fitness app for today and the last 4 days.

Each page of this booklet corresponds to 1 day. Place the first page on your actual phone screen and mark the high and low points of your physical activity
 Now write what you were doing during those points. Write what your data shows you beyond the number and think about why.

4. Continue doing the same for all the pages

5. The last page is meant to help you set goals for yourself for tomorrow. Draw what you'd like your data to tell you when you look at it later.

n (Today) n (Today) n-1 (restorday) -> elass / schod nork: related n-2 -> home n-3 ->





Shruti Aditya Chowdhury (CMU)

ges and what do they mean to you? u a holistic picture of the elements of fitness ed, articulate what motivates you to stay fit. current & firture relationship to here & " Through and whole the "

Shruti Aditya Chowdhury (CMU)

Predictability and determinism

'implies a one-way process in which the physical environment is the independent, and human behaviour the dependent variable.'

Maurice Broady, 1966, 'Social Theory in Architectural Design'

Treating people as components, with predictable properties so they can be incorporated into your system

WHY CAN'T I HAVE A TABLE WHERE I LOOK UP HOW TO GET PEOPLE TO DO WHAT I WANT THEM TO DO?'

ANIS(#100 V52 3V31

ALL RIGHTS RES EMR QA IGMAYS

@1984-91 Adobe Systems © 1981 Linotype AG and Subs

HH1







Image: <u>xlb.com.au</u>



Image: anonymous Imgur uploader, 2012

Speeding Costs You

Demerit Points 120 km/h = 3 Points 130 km/h = 4 Points 140 km/h = 4 Points

BEST VALUE!

Image: mrmewlepants, Imgur, 2014

Innovation is often about perceiving affordances that others haven't











Image: slippinjimmy, Imgur, 2012





Image: /u/gatorb888, 2015

Image: crazyhyena.com, 2013

Learn from workarounds – what are people trying to do?

Learn from workarounds – what are people trying to do? Can we help them solve their problems? 1) Understanding what people are trying to do, and helping them do it better





NO BARBECUES PERMITTED IN THE PARK

Barbecuing causes permanent damage to the grass structure. Thank you for your cooperation.



www.royalparks.org.uk















People are inherently bad at making decisions, so experts need to intervene and help them People are inherently bad at making decisions, so experts need to intervene and help them People are inherently OK at making decisions, so experts ought to learn from them

'Paving the cowpaths'



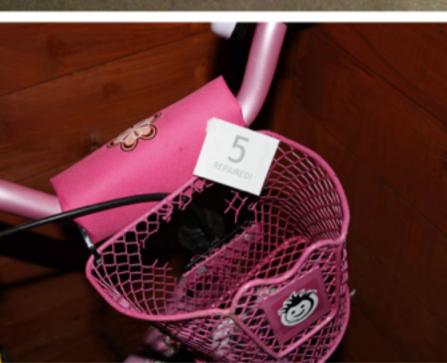


2) Understanding how people understand the world, and helping them understand it differently

Design for behavior change around repair











3



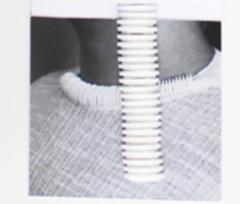


Nazlı Gökçe Terzioğlu (RCA)





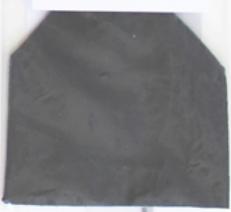


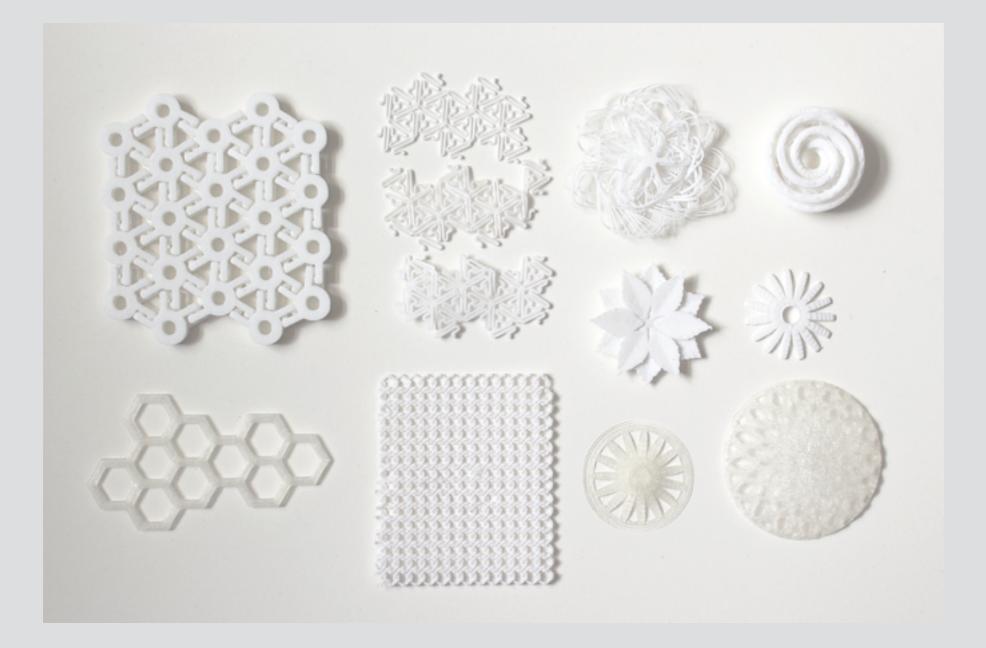




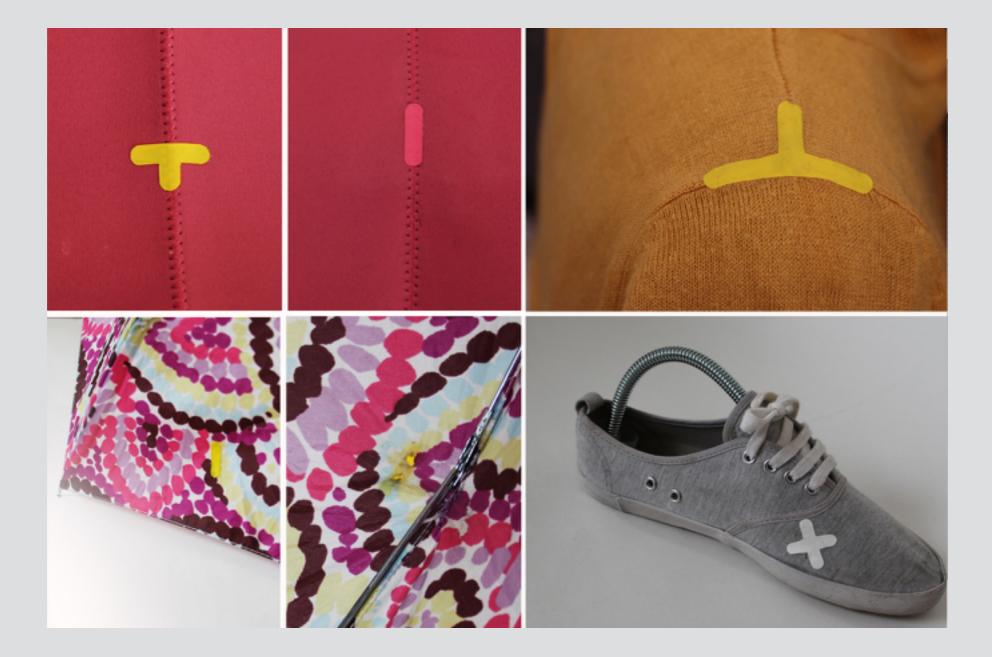




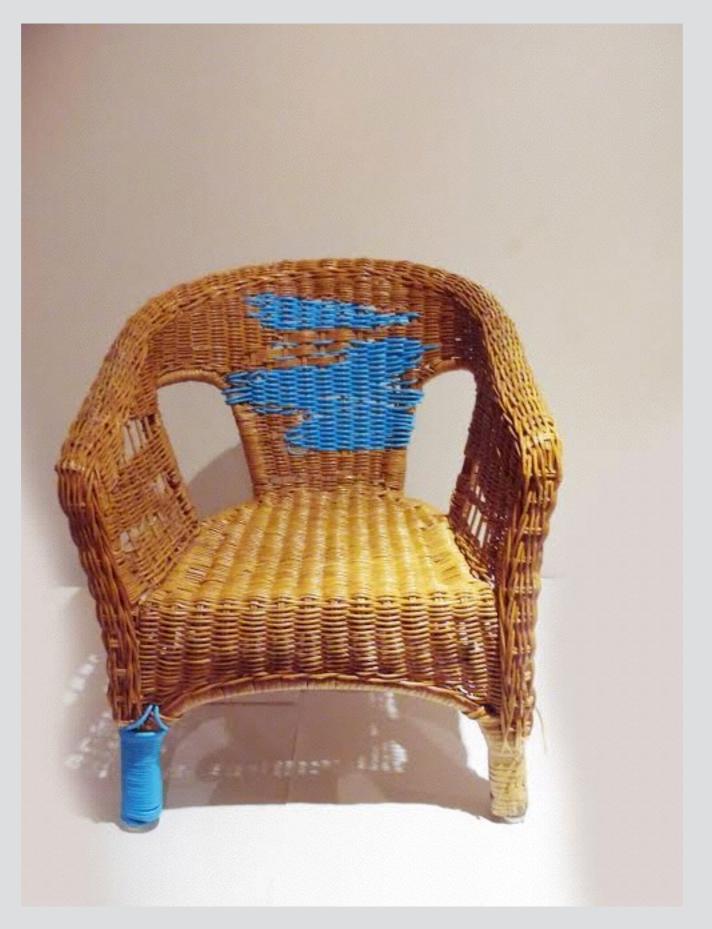












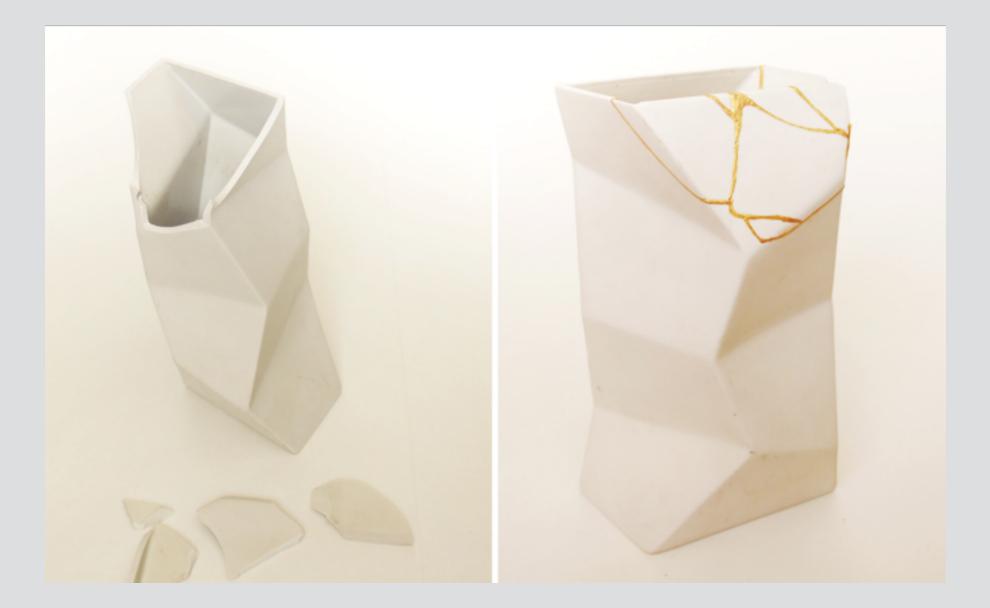
VICTORIAN GLASS LUSTRE

After living approximately 150 years as a whole piece this Victorian lustre was acodently broken by the antique shop owner 2 months ago Unfortunately, he threw away the broken parts and he had no idea what to do with it. Researcher 3D printed

Dr Nazlı Gökçe Terzioğlu

CROTCHET REPAIR



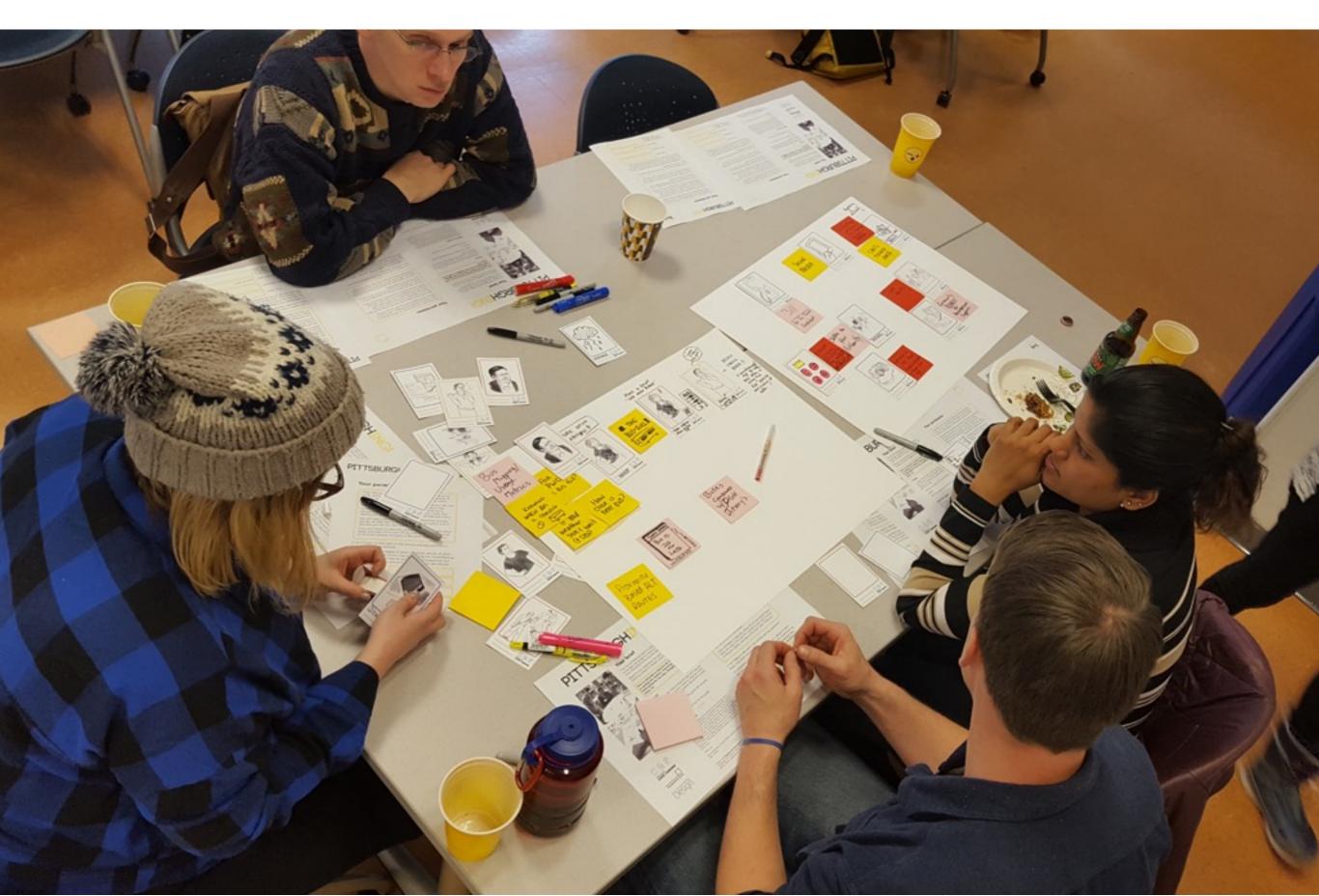


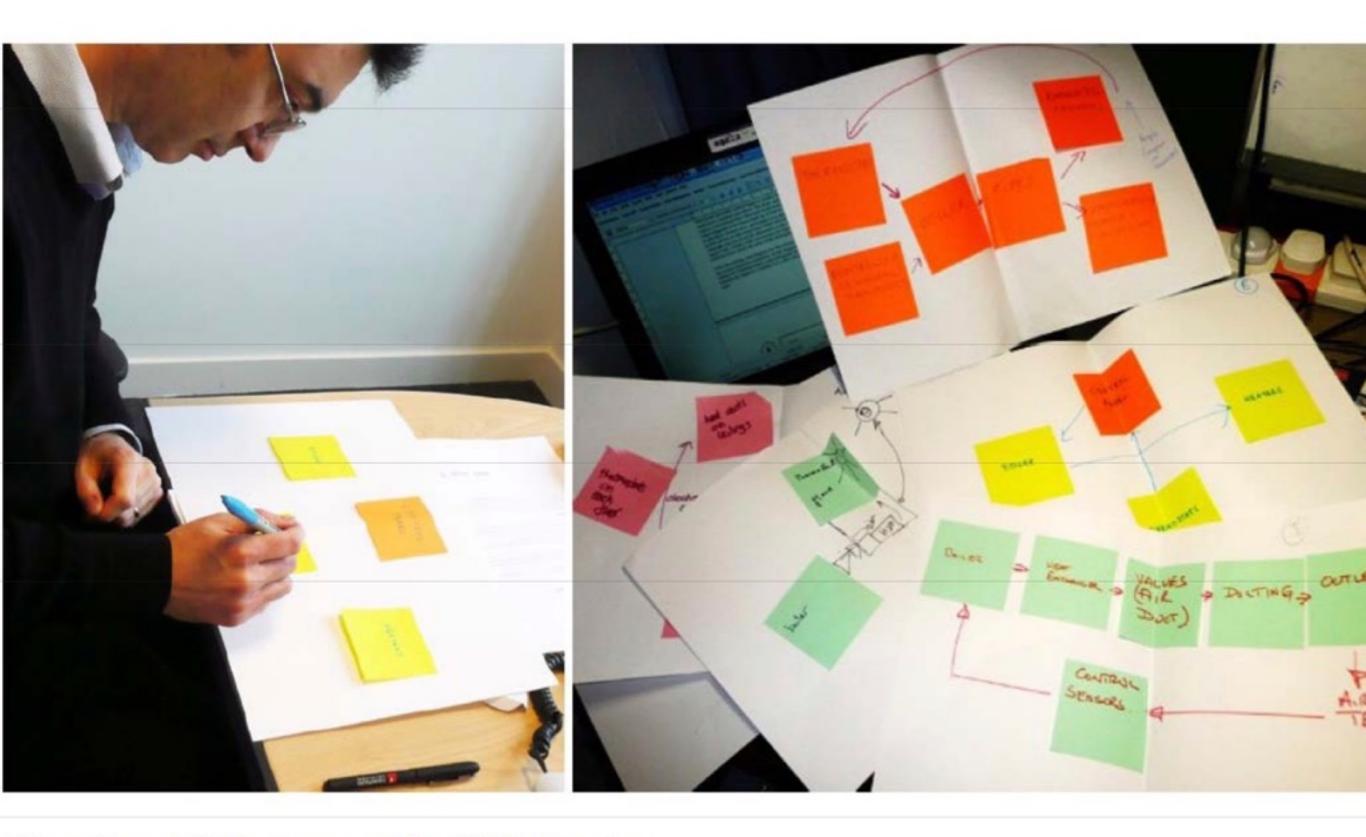
mental models and mental **Imagery**





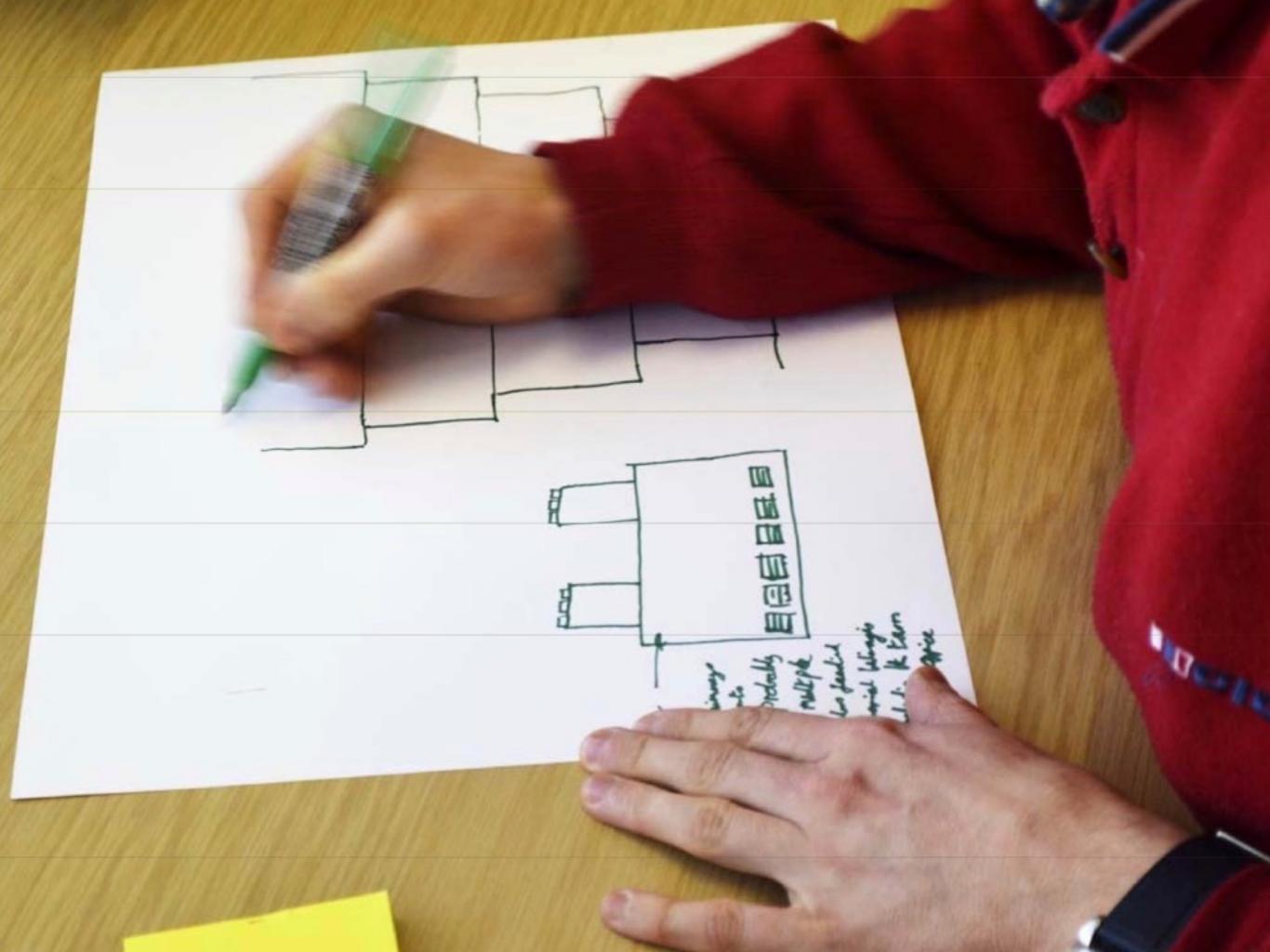


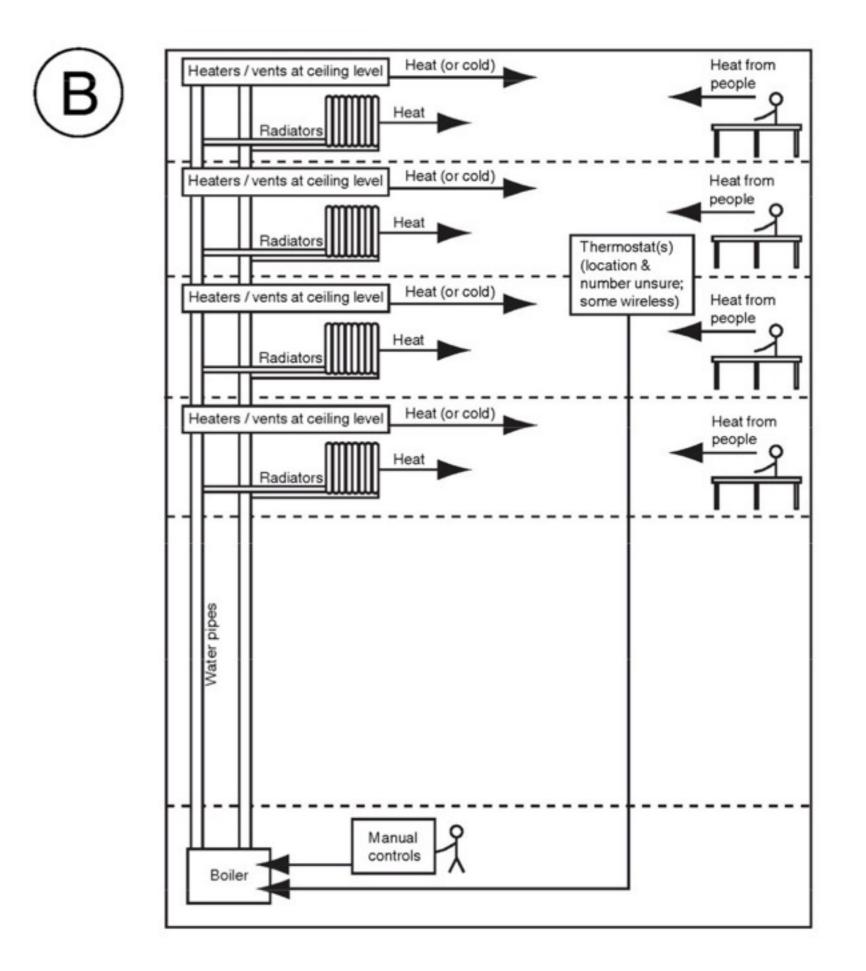


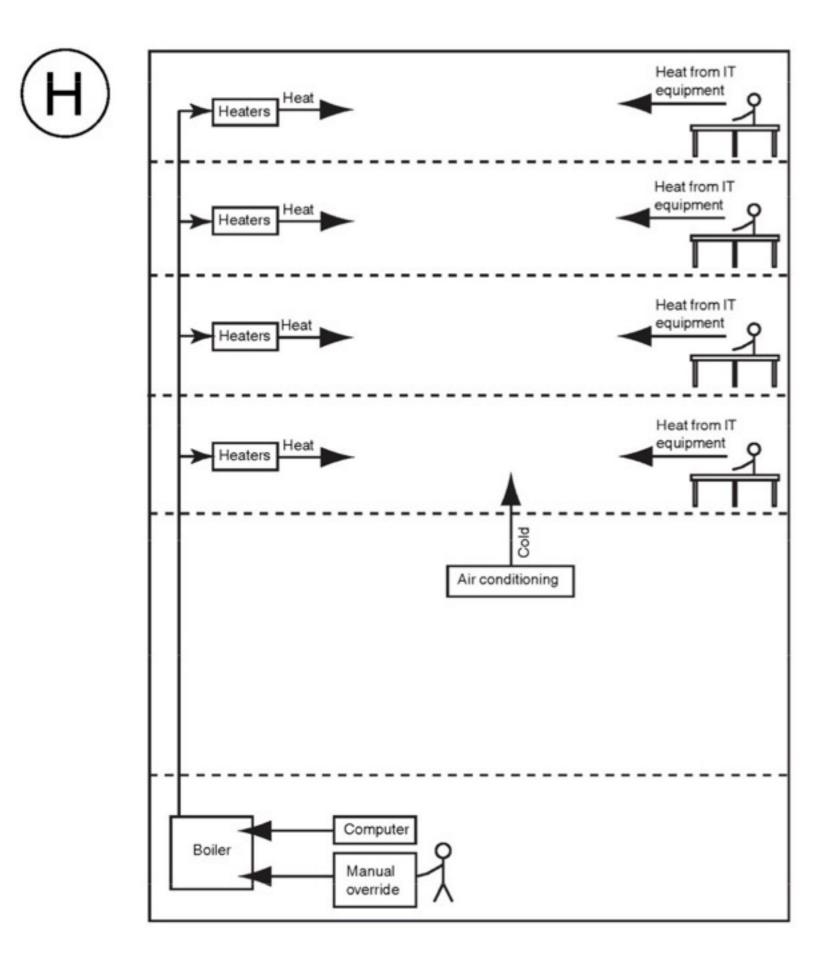


Mental model diagrams of the HVAC system

















RCOLAS

Lime

Energy's 'invisibility' is a key issue in people's understanding

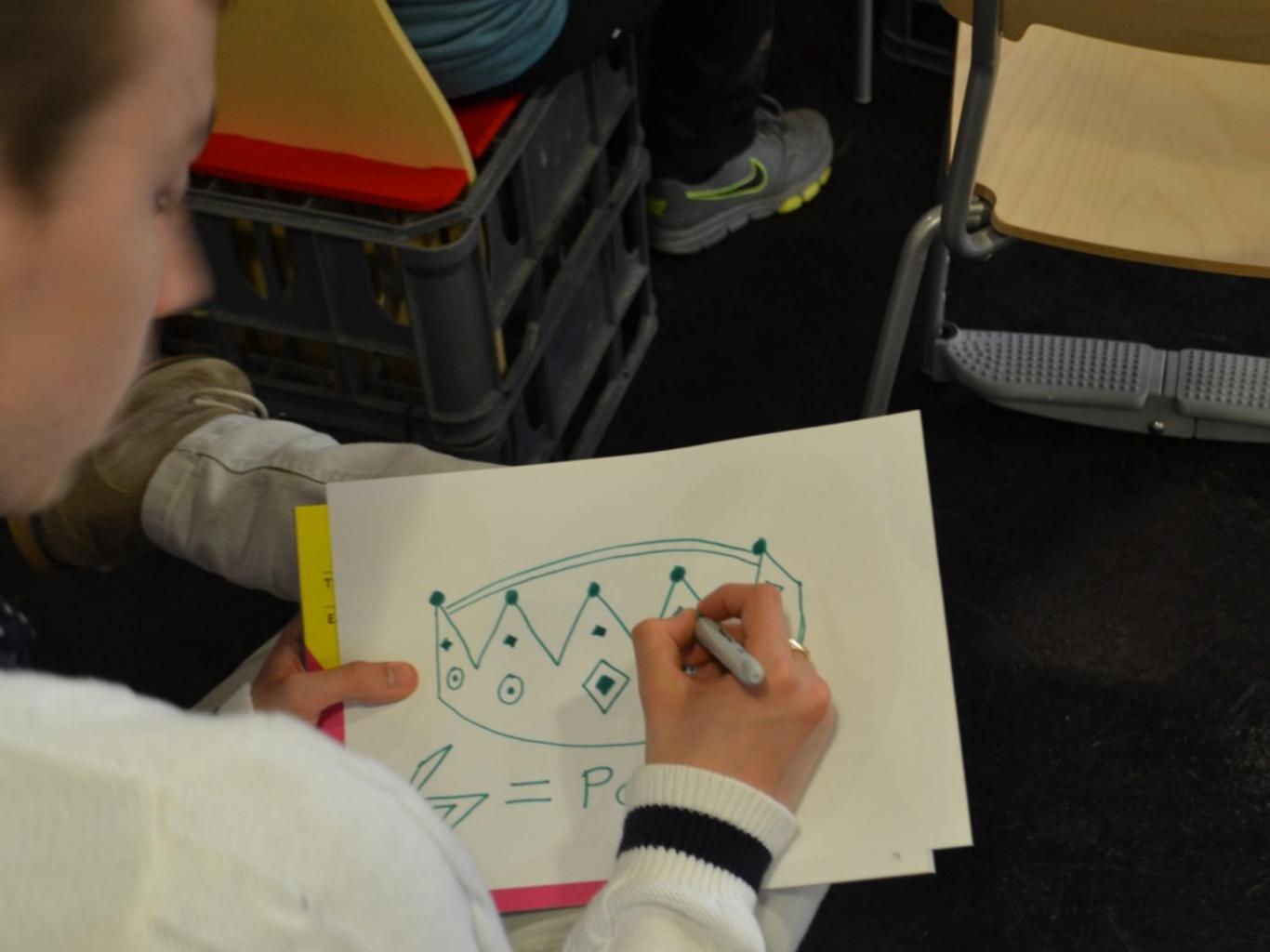
Drawing Energy

1

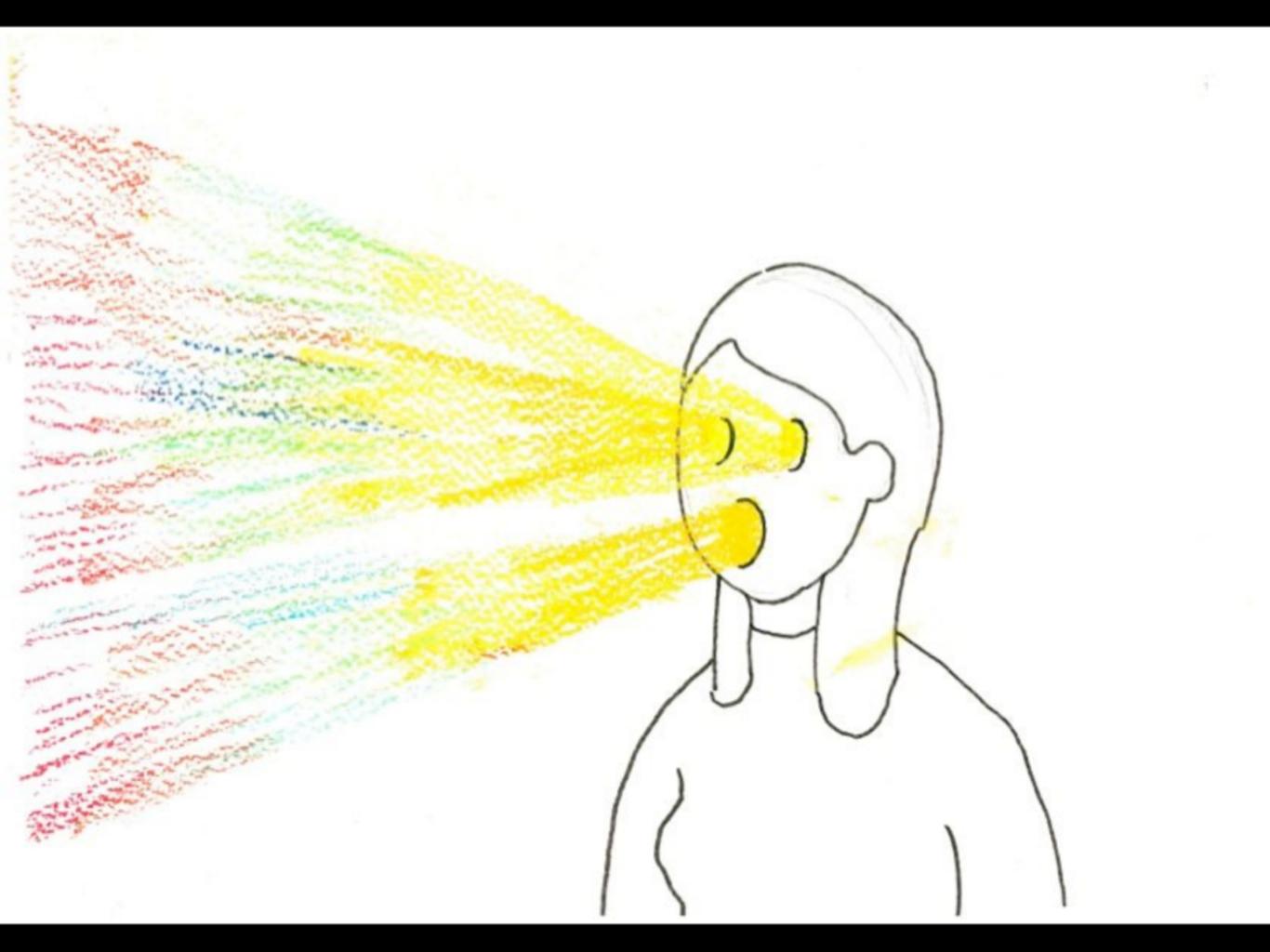
V&A Digital Design Weekend ~13,700 visitors 100 Drawing Energy participants

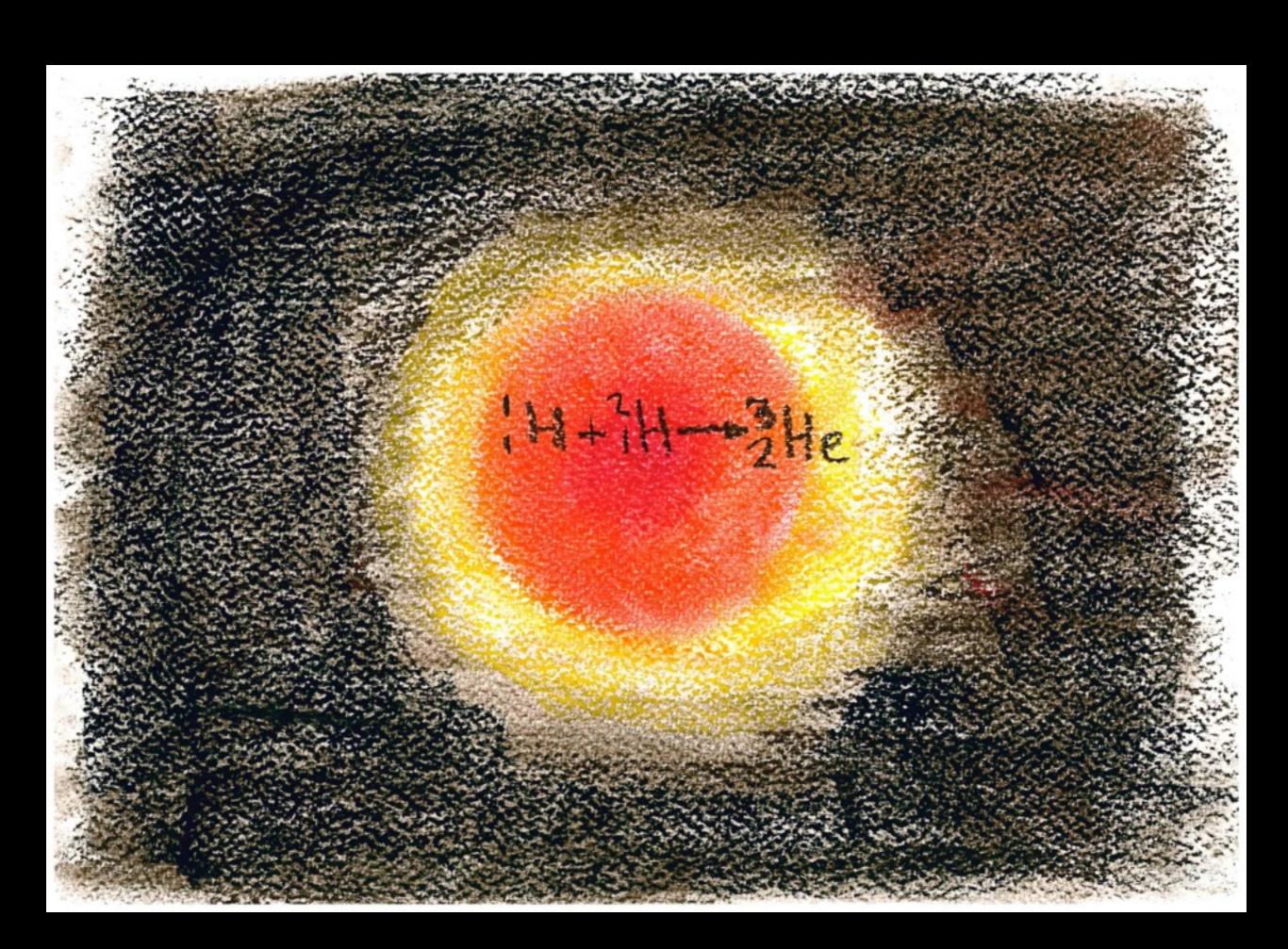
What does energy look like?





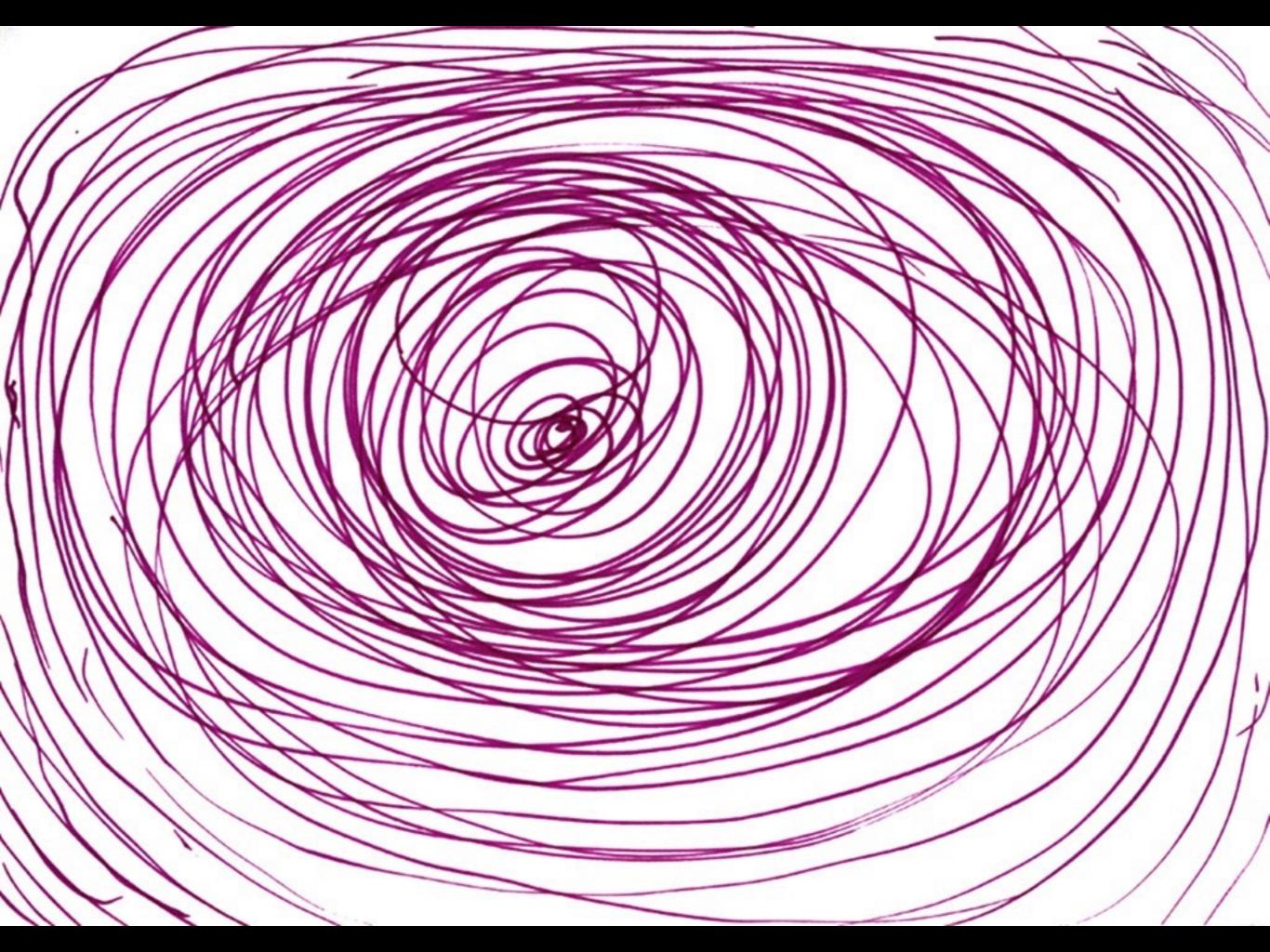


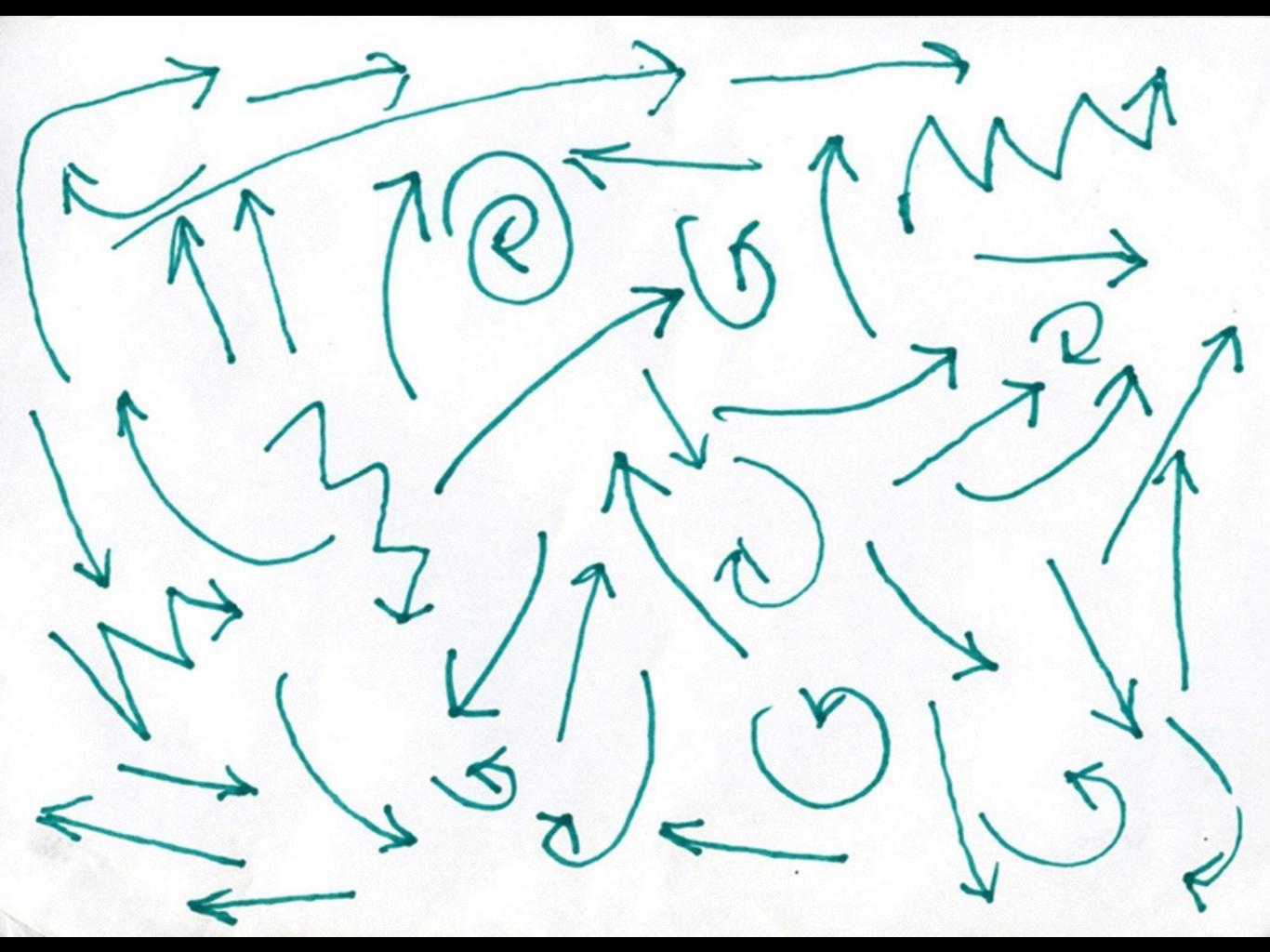










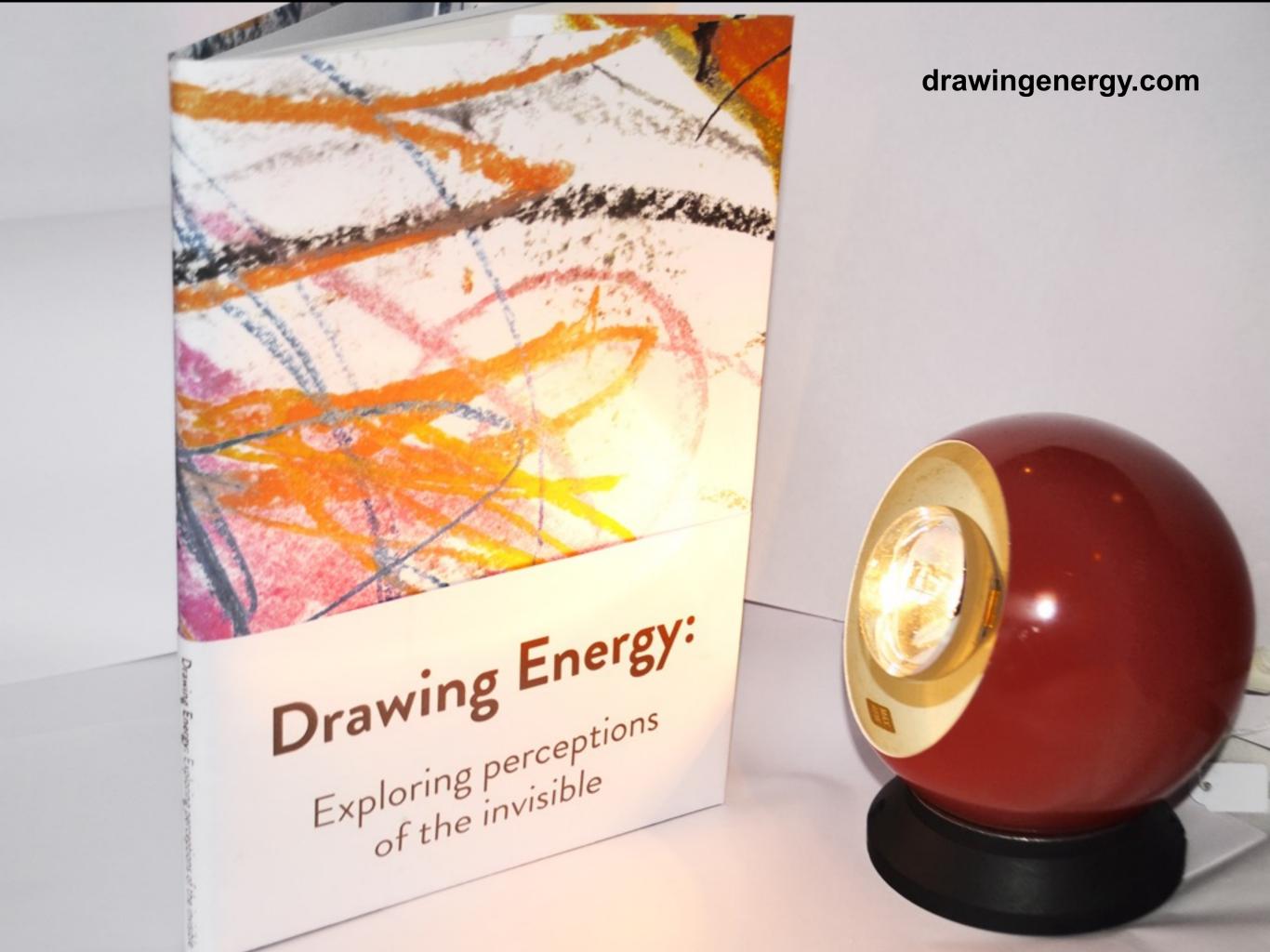






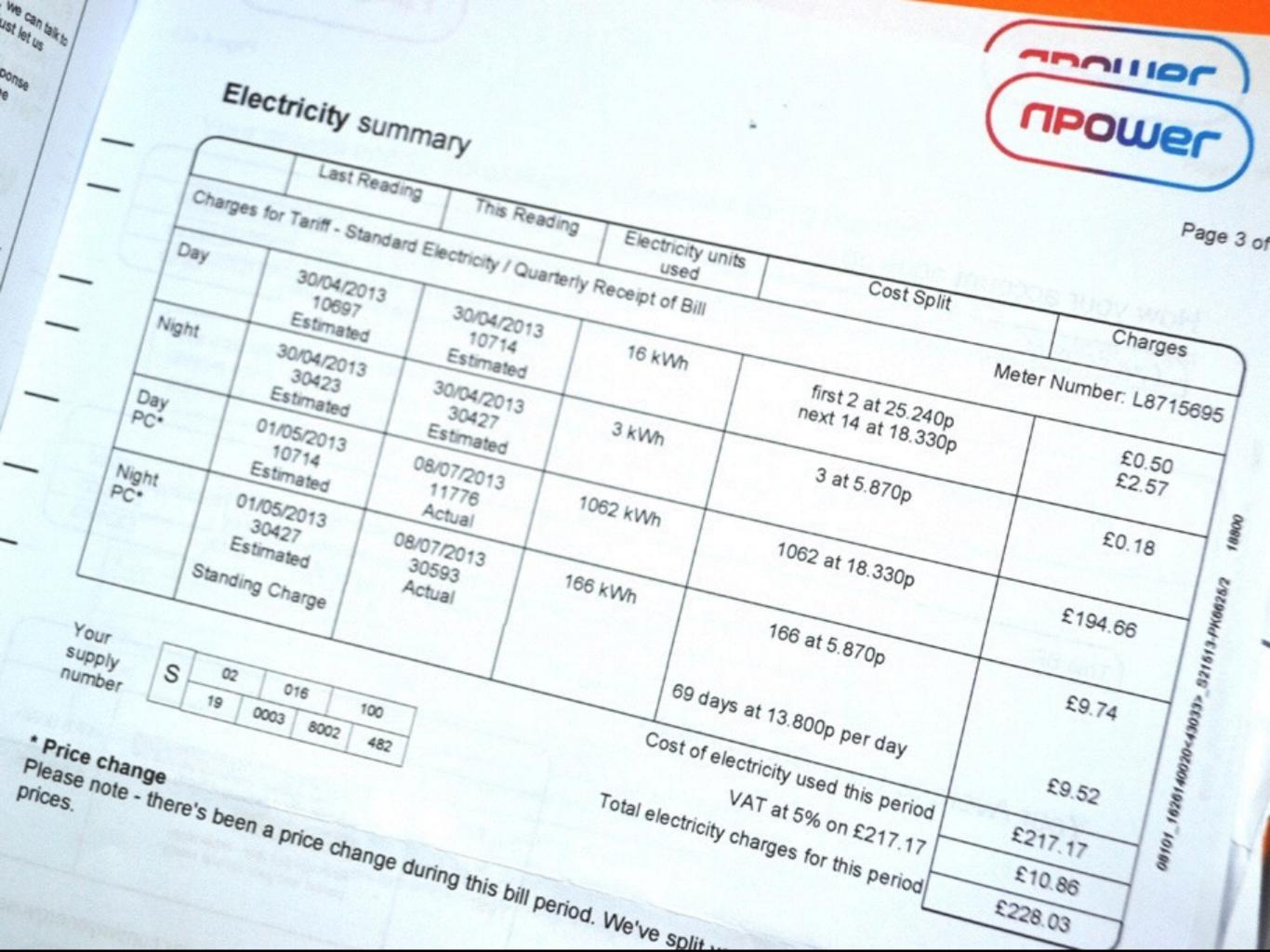






new metaphors new interfaces



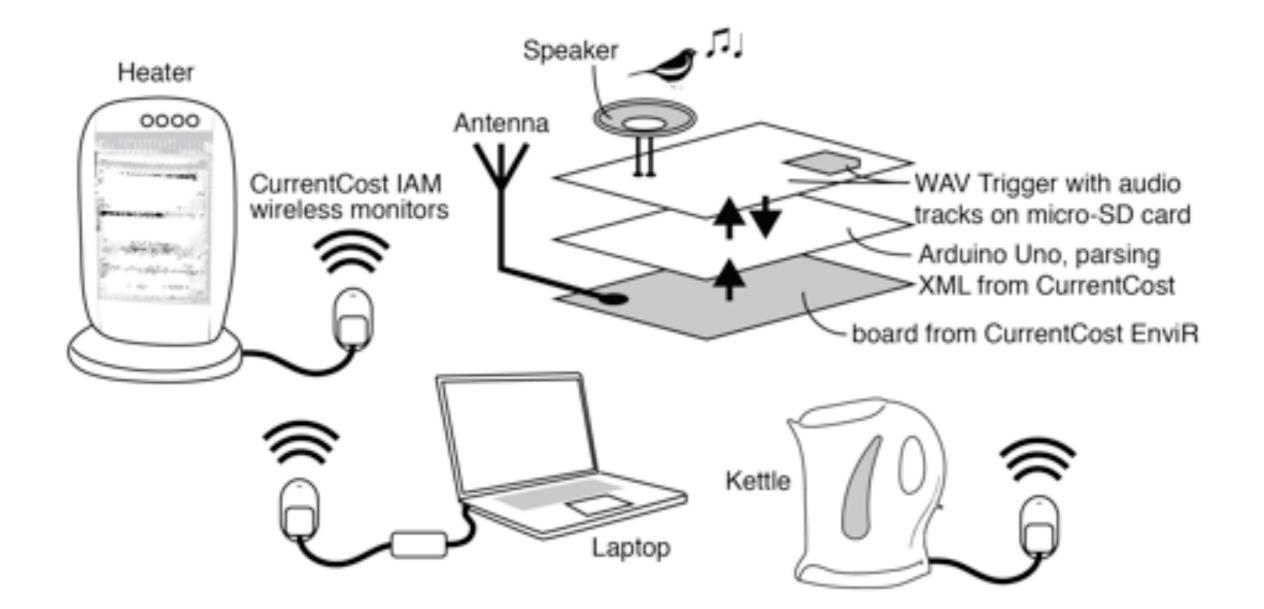


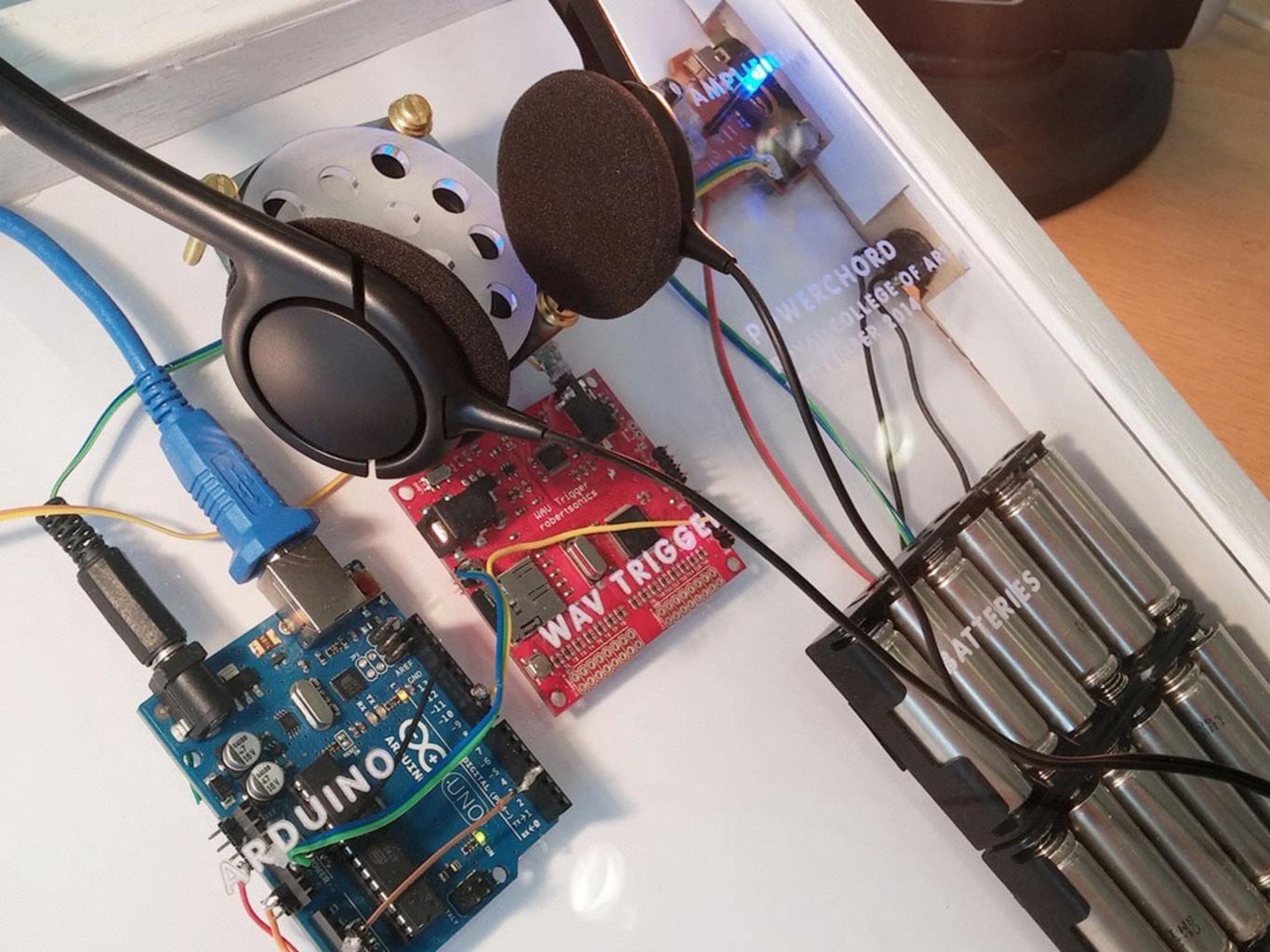
Are numbers and graphs the best way to talk to people about energy?

What does energy look like? What could it sound like?









Power ranges

Sound files

0-5W

6-30W 31-150W 151-390W 391W - 500W 501W - 500W 901W - 1700W 1701W and over

Track A (low intensity) Track B Track C Track D Track D Track E Track F Track G (high intensity)

Nothing played

per appliance, in parallel



Carnegie Mellon University

SEARCH

60

💙 F

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WILTON E. SCOTT INSTITUTE FOR ENERGY INNOVATION | > About the Scott Institute > CMU Energy Facts

CMU Energy Facts

Over the coming decades the world must make fundamental transformations in how energy is used and produced. That's where we come in.

The Wilton E. Scott Institute for Energy Innovation at Carnegie Mellon University is focused on:

- Using and delivering the energy we already have far more efficiently
- Expanding the mix of energy sources in a way that is clean, reliable, affordable and sustainable
- Creating innovations in energy technologies, regulations and policies

CMU is uniquely suited for these challenges with our many research centers and longstanding faculty expertise in technology, policy, integrated systems and behavioral science.

What makes us different is our ability to seamlessly combine these areas for maximum impact.

CMU Energy Solutions: Technology, Cybersecurity, Public Policy

Innovations from CMU faculty and researchers have been making an impact for decades. They have:

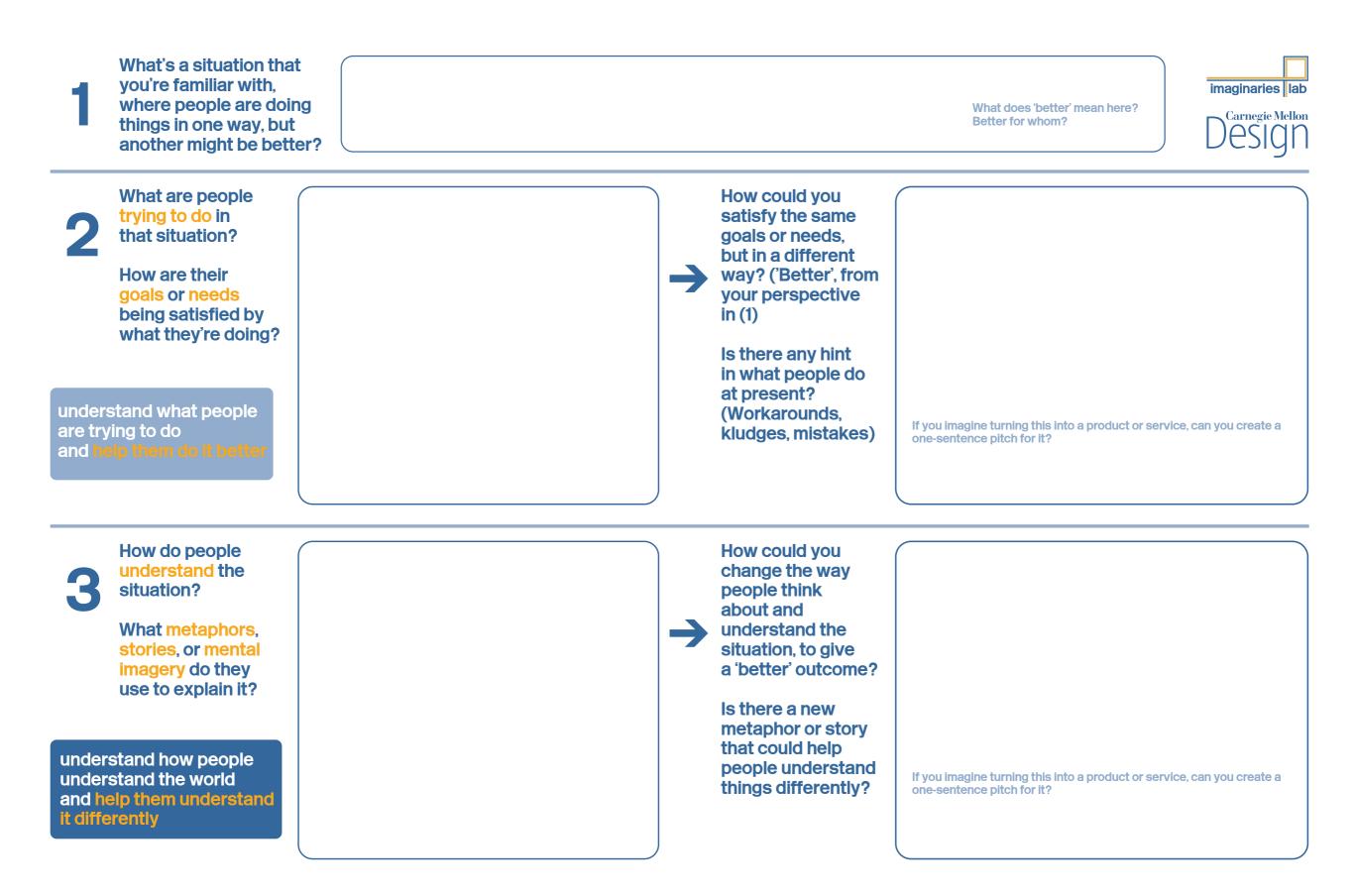
- Developed new electric grid communications architectures that can withstand disruption from hackers while working on a more reliable U.S. electric system to protect it from cyber attack. Read More »
- Provided one of the most detailed and useful studies on the increased greenhouse gas impacts of closing down nuclear plants in the wake of the

Spring 2018: **Electric** Acoustic

Activity

Understanding what people are trying to do, and helping them do it better

Understanding how people understand the world, and helping them understand it differently



The CMU. Design Center





Thank you!

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