



tell us what the project is  
what decision you were dealing with and the ecosystem

## OVERVIEW + INTRODUCTIONS

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## WITH YOU:

info + consent form  
name tag

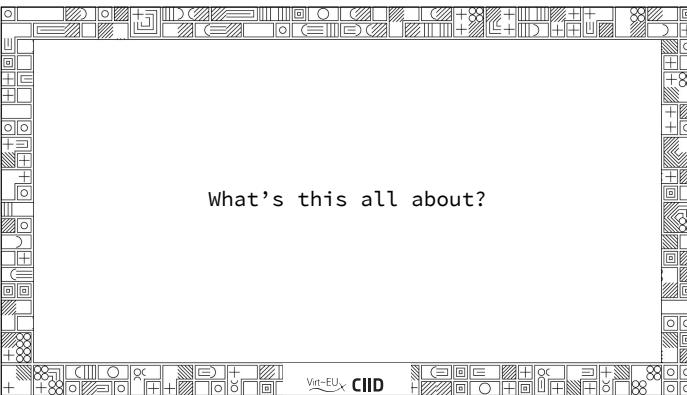
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Make sure you have signed the consent form and read the info sheet / that you put a name tag on / that you have your homework

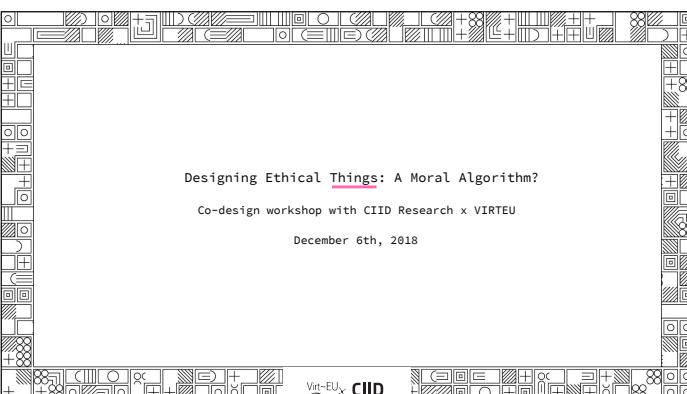
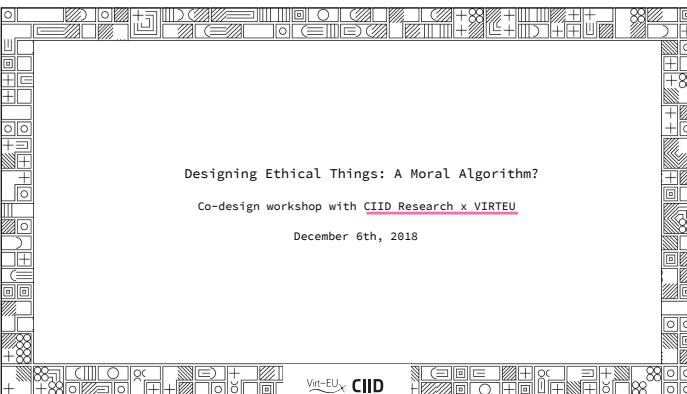
Let's meet.

your name and where you traveled here from.

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This is the first thing: CIID Research is working on the project VIRTEU - an EU-funded Horizon2020 project to figure out how do European IoT innovators and developers make ethically consequential decisions – about code, hardware and data – for new connective devices? But in this project, we are trying to figure out how ethics might be woven throughout - the actual creation - from the first moment of an idea through the process of making the idea happen.



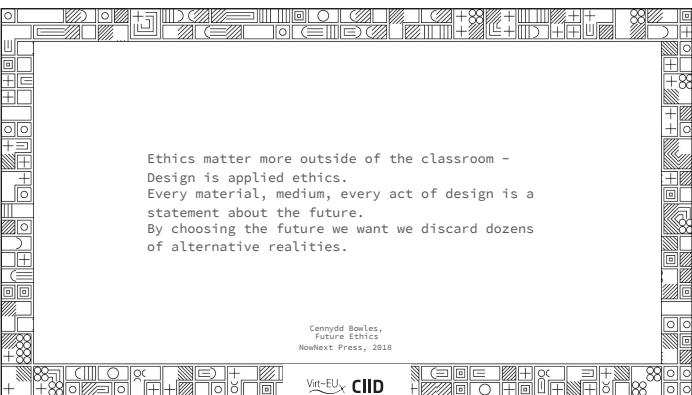
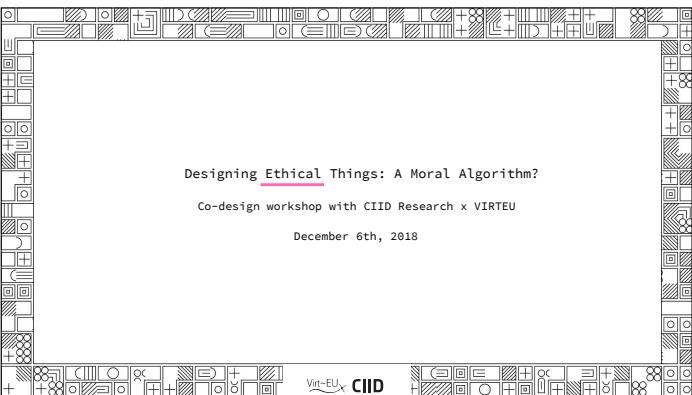
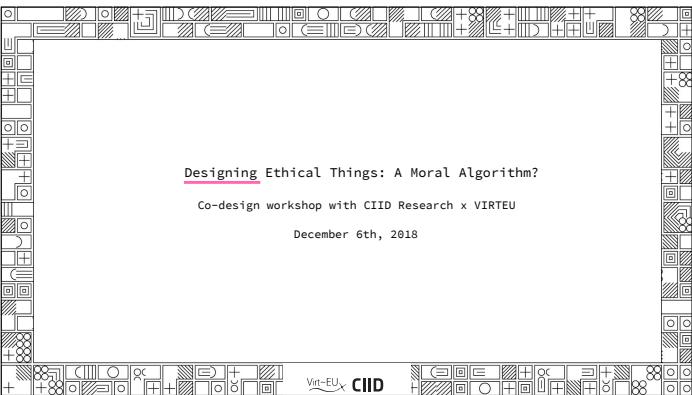
Let's take a moment to discuss "Things" and "Ethics." When we talk about "things" in this workshop, we are thinking of Internet of Things - as in - objects that are connected to the internet. Lights you can control. Fridges that tweet messages to you. And so on.

The numbers are staggering:

Over 20 billion connected things by 2020 and approximately 4.7 million developers with the ability to create them. Jonathan Zittrain,

From Westworld to Best World for the Internet of Things

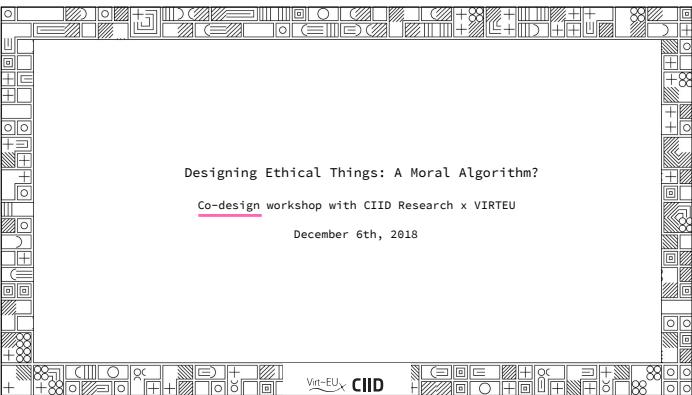
NYT, June 2018



When we talking about “Designing”, we actually are having in our mind - people who are themselves creating those “Things.” So, start-ups, small companies, all of the kickstarters you never funded. Increasing numbers of formerly human-run processes will be automated using devices and algorithms not easily understandable by the folks affected by them in areas such as data ownership, algorithmic bias, privacy, and regulatory compliance.

If many IoT developers and designers are faced with an overwhelming amount of ethical choices and consequences of their developments, we think it's important to try to understand from a developer and designer perspective ethics and IoT is concretely about in the everyday practices of IoT creation. Because only then can we create a set of tools that will help developers deal with some of these ethical issues arising throughout the development process of IoT devices.  
As a developer told me yesterday: ‘Ethics starts where the law ends’. And this is where we enter with our tools

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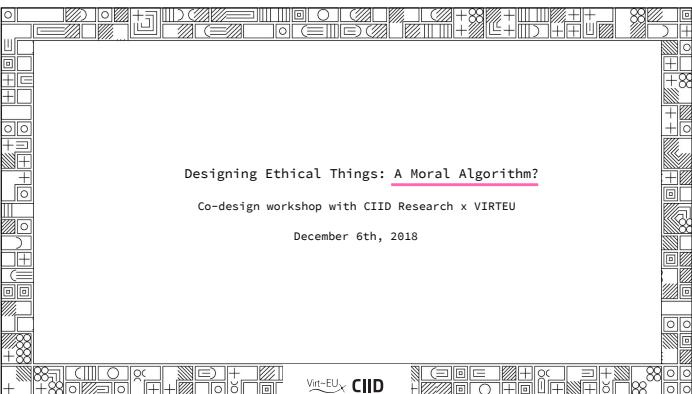


Designing Ethical Things: A Moral Algorithm?

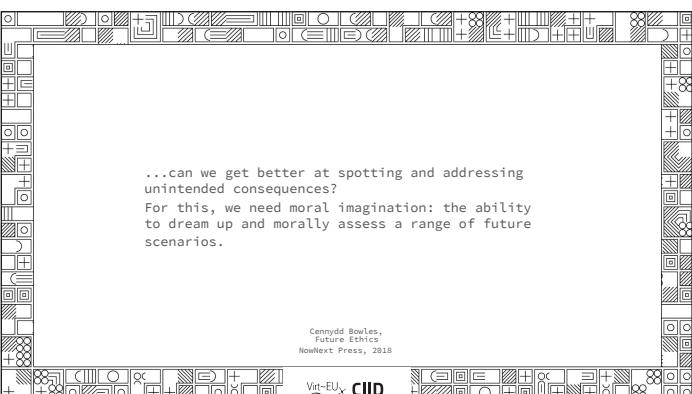
Co-design workshop with CIID Research x VIRTEU

December 6th, 2018

Virt-EU x CIID



what is this moral algorithm thing? ah ha, you will find that out later

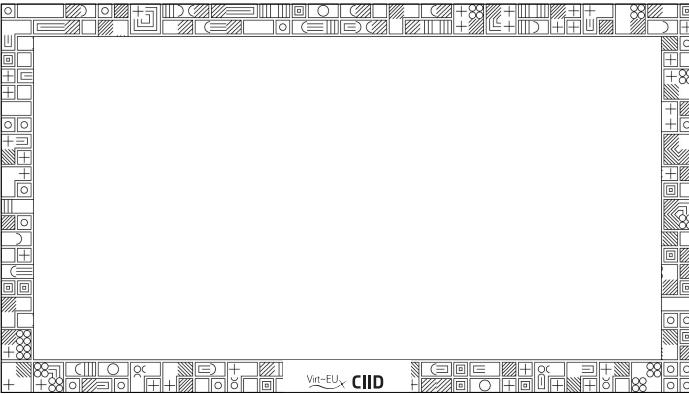


...can we get better at spotting and addressing unintended consequences?  
For this, we need moral imagination: the ability to dream up and morally assess a range of future scenarios.

Comnydd Bowles,  
Future Ethics  
NowNext Press, 2018

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If many IoT developers and designers are faced with an overwhelming amount of ethical choices and consequences of their developments, we think it's important to try to understand from a developer and designer perspective ethics and IoT is concretely about in the everyday practices of IoT creation. Because only then can we create a set of tools that will help developers deal with some of these ethical issues arising throughout the development process of IoT devices.  
As a developer told me yesterday: 'Ethics starts where the law ends'. And this is where we enter with our tools.



And this is where we enter with our tools. But we need your help! This session is intended for you to imagine you are working at an IOT company, faced with a problem they might be faced with, and take on a series of processes to try a “Moral Algorithm.”

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#### GROUND RULES

1. There are no stupid questions
2. I probably don't know the answer
3. All thoughts, additions, suggestions are useful for us. Please put them on post-its: we will gather and share feedback at the end
4. You are each here for a reason - you know it - so share, wonder and open up
5. If you need to go to the bathroom, get water, take a call for work, go for it and no worries!
6. THIS IS A PROTOTYPE



## Agenda

### ARRIVAL

Name tags, consent forms

### OVERVIEW + INTRODUCTIONS

Internet of Things, Ethics  
Our company + Values  
—short break—

Our company's problem of the day  
A Moral Algorithm?

Feedback and Brainstorm

END

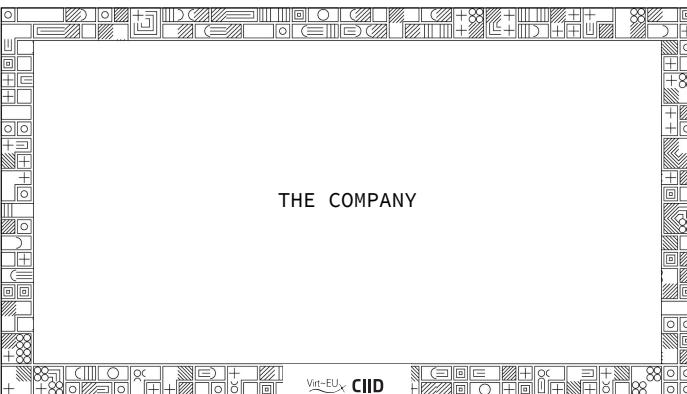


A hammer intends to strike, a vice intends to hold fast, a lever intends to lift. They are what it is made for.  
But sometimes a tool may have other uses that you don't know.  
Sometimes in doing what you intend, you also do what the knife intends, without knowing.  
Can you see the sharpest edge of that knife?

The Amber Spyglass: His Dark Materials  
by Philip Pullman

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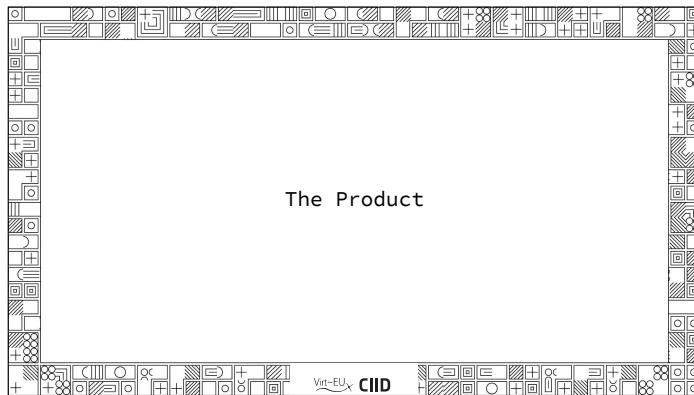
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let's get started. we are working together at a new company. you've just been hired in! so let's watch the video to onboard you again about the company vision



the product we are working on is...



Our Product

A MORAL ALGORITHM?

**Bear & Co.**

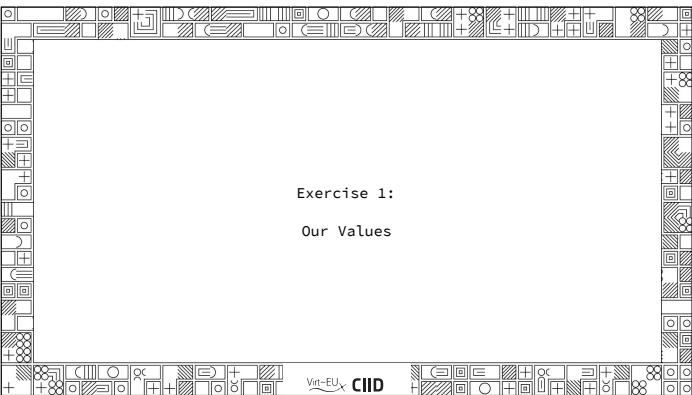
Bear & Co., "A message you can hug." It's a special Bear that allows friends and friends who are far away from each other to exchange heartfelt voice messages no matter where they are. Friends of the Bear can record and send messages using the BearApp. Someone at home gets the message on their BearApp, approves it and delivers it wirelessly to the Bear. The Bear's heart will blink when it has a message. Squeeze the Bear's paw to play the message. Record a message by squeezing the Bear's paw again. The message can be delivered to a BearFriend anywhere in the world! The Bear is friendly and happy in anyone's home - from elderly to the teenagers.

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A MORAL ALGORITHM?  
(in 4 exercises)

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our onboarding today is going to tax our mental muscles: we will range from thinking about the ethical values we want to embrace and uphold at bear+co, and then we will deal with a current design decision through a series of imaginative and evaluative tools. we'll make decisions and share what we learned.



first of all, what are the values you will seek to uphold here at bear and co?

**Exercise 1**  
Main Goal

## Our Values

Take a look at the list below and make sure you understand each value we stand for at Bear & Co.

**Useful-first:** design useful things for people's lives  
**Security:** keep everything and everyone as secure as possible  
**Privacy:** build and promote a culture of privacy  
**Data-careful:** be deliberate about the data we collect  
**Transparency:** be clear about the 3rd parties associated with the product  
**Openness and empowerment:** users can be masters of their domain  
**Sustainability:** design things as if they will last forever  
**Social Impact:** help people, societies, communities thrive

**STEP 1.**  
Mark how 'important' each value is to you. The closer to the edge, the more important. The closer to the center, the less important.

**STEP 2.**  
Connect your marks to create the shape of your priorities.

**KEY**  
Center of Ring: The Least Important  
Edge of Ring: The Most Important

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- here's your handout, turn to your partner and work together

**Exercise 1**  
Main Goal

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- fill it out like this

- then connect

**Exercise 1**  
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- then put actual numbers to each line you drew

**Exercise 1**  
Main Goal

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**STEP 2.**  
Connect your marks to create the shape of your priorities.

**Multiplication Card A MORAL ALGORITHM**

**Fuzzy to cold numbers**

Write a number for how important each value is, based off the ring below. From 0-1 (e.g. 0.4 or 0.8)

Useful-first	0.....
Security	0.....
Privacy	0.....
Data-careful	0.....
Transparency	0.....
Openness	0.....
Sustainability	0.....
Social Impact	0.....

**KEY**  
Center of Ring: The Least Important  
Edge of Ring: The Most Important

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- DOES NOT HAVE TO ADD UP TO 1

**Exercise 1**  
Main Goal

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**Multiplication Card A MORAL ALGORITHM**

**Fuzzy to cold numbers**

Write a number for how important each value is, based off the ring below. From 0-1 (e.g. 0.4 or 0.8)

Useful-first	2
Security	8
Privacy	3
Data-careful	6
Transparency	4
Openness	8
Sustainability	7
Social Impact	6

**KEY**  
Center of Ring: The Least Important  
Edge of Ring: The Most Important

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SHORT BREAK!

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- ok so what is next? the problem of the day

## Agenda

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Name tags, consent forms

### OVERVIEW + INTRODUCTIONS

Internet of Things, Ethics

Our company + Values

—short break—

Our company's problem of the day

A Moral Algorithm?

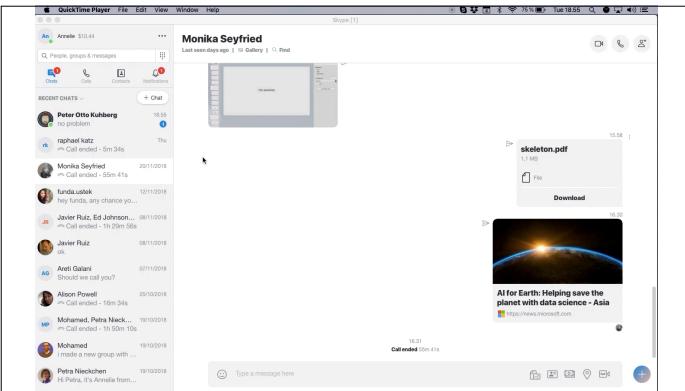
Feedback and Brainstorm

END

THE PROBLEM

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## listen to the problem

**Main Scenario**

**A MORAL ALGORITHM**

**Happy or Sad Bears?**

**Description**

The Bear is up and running and the team is looking for ways to increase its usefulness to our customers as well as to the environment. One idea is adding a new feature to the app which would track the emotional progression of the user. This would be done by tracking the emotional progression of the votes posted on the platform. The team for Bear & Co. to push into the field, as it would be a great way to increase user awareness and providing as much

**Option A**

Let's implement the AI feature. People are going to love training. How their communication progresses.

**Option B**

No way. People can figure out how other people are feeling by just being in contact.

**Discussion Points**

Would implementing machine learning make bear more or less sustainable? Is the AI feature a good idea? Would it be better if they had the support of the emotional tracker? Would people be fearful if they were being monitored?

- here's your problem summary sheet

**A moral algorithm: a series of instructions for manipulating data that generates a result in this case a numerical rating for the various options being considered.**

I suspect many of us will find this kind of calculation to be too reductive, taking a complex, emotional decision and compressing it down to a mathematical formula. But, of course, the whole process is dependent on the many steps that have preceded it...

Steven Johnson  
Farsighted: How We Make the Decisions That Matter the Most  
Riverhead Books, 2018

what is this moral algorithm?

- a way to deal with difficult decisions

## A MORAL ALGORITHM? (3 more exercises)

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**Exercise 2:**  
**If everyone in the world...**

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- here's your worksheet

Exercise 2	Main Goal	Key Actions
<b>If everyone in the world...</b>	<i>Engage your moral imagination and discover unexpected outcomes of taking this option</i>	<i>Describe the scenario</i>
<i>If everyone in the world had your option, and you took it, what would happen? What are the good, weird and bad things that could happen?</i>	<i>Sketch a moment in the scenario</i>	
<i>STEP 1: Write the option you are considering. Describe the scenario well. How this could go well.</i>		
<i>STEP 2: Describe and sketch: Use your own assessments and descriptions to help your narrative.</i>		
<i>Option Description (the option)</i>	<i>Sketch a moment in the scenario</i>	
<i>NIRIO x INHEP-D (narrative)</i>		
<i>Also consider</i>		

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- add one of these to your scenario sheet and try to imagine with it in mind... for example:

<b>Destabilising Factors</b>	<b>Climate</b>
• Natural disasters	• Electricity outages
• Increased pressure to be as sustainable as possible	• -----
<b>Destabilising Factors</b>	<b>Under-rep'd</b>
• Who do you least expect to use your product?	• To whom do you NOT plan to market your product?
• -----	• -----
<b>Destabilising Factors</b>	<b>Context</b>
• Where do you least expect your product to find a home?	• What situations - cultural, social, political - might occur around your product?
• -----	• -----
<b>Destabilising Factors</b>	<b>Technology</b>
• Artificial intelligence	• Face recognition
• Speech recognition	• Blockchain
• -----	• -----

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<b>Exercise 2</b>	<b>Main Goal</b>	<b>A MORAL ALGORITHM</b>
<b>If everyone in the world...</b>	<b>Key Actions</b>	
IF everyone in the world had your company's AI, what would happen? what are the good, weird and bad things that could happen?	Describe the scenario	Sketch a moment in the scenario
STEP 1. write the option you are considering Step 2. discuss the scenario for how this could go well...		
STEP 2. Describe and sketch: use these triggers and descriptions to help your narrative.		
<b>implement a.i.</b> (the option)	<b>WIBRO x UNDER'D sexually</b>	
<i>close circles</i>	<i>open circles</i>	

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- the option to implement AI, with the destabilising factor of "sexuality" leads to this scenario

<b>Exercise 2</b>	<b>Main Goal</b>	<b>A MORAL ALGORITHM</b>
<b>If everyone in the world...</b>	<b>Key Actions</b>	
IF everyone in the world had your company's AI, what would happen? what are the good, weird and bad things that could happen?	Describe the scenario	Sketch a moment in the scenario
STEP 1. write the option you are considering Step 2. discuss the scenario for how this could go well...		
STEP 3. Based on what you imagined in previous steps, rank each option based on how well it aligns with the company's core values. From 0% to 100%.	<b>Rating Card</b>	<b>A MORAL ALGORITHM</b>
Describe and sketch: use these triggers and descriptions to help you	Option A rating	Option B rating
<b>implement</b> (the option)		
<i>useful-first</i>		
Security		
Privacy		
Data-careful		
Transparency		
Openness		
Sustainability		
Social impact		

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- after you are done with making scenarios for both options, rate how well the options do in terms of those company values we looked at before the break

**Exercise 2**

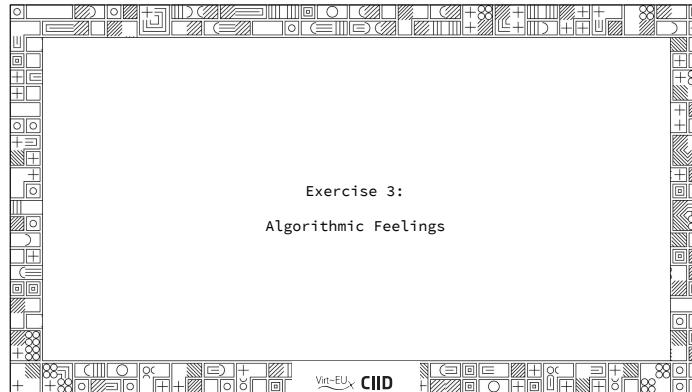
Main Goal: If everyone in the world...  
What does it mean? What are the good, negative, neutral aspects?  
STEP 1. write the option you are considering on one side of the card. How this could be evil?  
STEP 2. Describe and invent other options and their destinations to help you implement the system.

**Rating Card**

	A MORAL ALGORITHM	
	Option A rating	Option B rating
Useful-first	20	80
Security	30	90
Privacy	30	
Data-careful	30	
Transparency	40	
Openness	40	
Sustainability	50	
Social impact	40	

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- give numeric rating between 0 and 100 (0 is worst, 100 is best)



- now that we have imagined, rated, valued, weighted, let's put it together

**Exercise 3**

Main Goal: Algorithmic Feelings  
Translate your understanding of these options from rich insights to cold numbers

**STEP 1.** Check back to your multiplier card. Write the cold numbers in the "multiplier" column.

**STEP 2.** Check back to your rating card. Write the rating by the values you came up with for each respective columns. (column A, rating column and column B, rating column)

**STEP 3.** Now multiply the multiplier with rating. This will help you to create the respective weighted ratings.

**STEP 4.** Add each weighted rate to sum the column.

**STEP 5.** The column with the most points is the option by the aligns with your values and priorities.

**STEP 6.** How do you feel about this?

**STEP 7.** Look back at your multipliers and ratings. Highlight the highest + lowest rating. What can you infer for the other option to be better aligned? Or do you need to create another option altogether?

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- DOES NOT HAVE TO ADD UP TO 1

**Exercise 1**

Main Goal

### Our Values

Take a look at the list below and rate each value we stand for at Star-E Co.

**Useful-first:** design useful things for society, help everyone and everyone as secure as possible  
**Privacy:** build and protect a culture of trust and transparency  
**Data-careful:** be deliberate about the data shared with the product  
**Transparency:** be clear about the data shared with the product and ensure users can be masters of their domain  
**Sustainability:** design things as if they last forever and help people, societies, communities thrive  
**Social Impact:** help people, societies, communities thrive

**STEP 1:** Rank how important each value is to you. The closer to the center, the less important it is.  
**STEP 2:** Use these ranks to create the shape of your priorities.

**Multplier Card**

**A MORAL ALGORITHM**

**Fuzzy to cold numbers**

Write a number for the important value +1, based off the ring below. From 0-1, (e.g. 0.4 or 0.8)

useful-first	2
Security	8
Privacy	3
Data-careful	6
Transparency	4
Openness	8
Sustainability	7
Social Impact	6

**KEY**  
Center of Ring: The Least Important  
Edge of Ring: The Most Important

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**Exercise 2**

Main Goal

### Algorithmic Feelings

Translate your understanding of these options from rich insights to cold numbers

**STEP 1:** Check back to your multiplier card, write the cold numbers in the "multiplier" column.

**STEP 2:** Check back to your rating card, write down what you came up with for the chart respective columns - rating column, option A column and option B column.

**STEP 3:** Now multiply the multiplier with each rating. This will allow you to create the respective weighted ratings.

**STEP 4:** Add each weighted rate to sum the columns.

**STEP 5:** The column with the most points is the option by which aligns with your values and priorities.

**STEP 6:** Test your values:  
How do you feel about this?

**STEP 7:** Look back at your multipliers and ratings. Highlight the highest + lowest rating. If one is higher for the other option to be better aligned. Or do you need to create another option altogether?

values	multiplier	Option A	Option B
Useful-first	0.2	rating	weighted rating
Security	0.8		
Privacy	0.3		
Data-careful	0.6		
Transparency	0.4		
Openness	0.8		
Sustainability	0.7		
Social Impact	0.6		

**Key Actions**

Translate your understanding of these options from rich insights to cold numbers

**Sum**

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**Exercise 3**

Main Goal

### Algorithmic Feelings

Translate your understanding of these options from rich insights to cold numbers

**STEP 1:** Check back to your multiplier card, write the cold numbers in the "multiplier" column.

**STEP 2:** Check back to your rating card, write down what you came up with for the chart respective columns - rating column, option A column and option B, rating column.

**STEP 3:** Now multiply the multiplier with each rating. This will allow you to create the respective weighted ratings.

**STEP 4:** Add each weighted rate to sum the columns.

**STEP 5:** The column with the most points is the option by which aligns with your values and priorities.

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How do you feel about this?

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values	multiplier	Option A	Option B
Useful-first	0.2	rating	weighted rating
Security	0.8		
Privacy	0.3		
Data-careful	0.6		
Transparency	0.4		
Openness	0.8		
Sustainability	0.7		
Social Impact	0.6		

**Key Actions**

Translate your understanding of these options from rich insights to cold numbers

**Sum**

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Rating Card	A MORAL ALGORITHM	
	Option A rating	Option B rating
<b>STEP 3.</b> Based on what you imagined in your multiplier card, rate each option based on how well it fits your priorities. Add up all the ratings for both options. (points in total to spread.)	Useful-first : 20	80
Security	30	90
Privacy	30	70
Data-careful	30	70
Transparency	40	60
Openness	40	30
Sustainability	50	30
Social impact	40	30

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Main Goal	A MORAL ALGORITHM		Key Actions			
			Translate your understanding of these options from rich insights to cold numbers			
	values	multiplier	Option A	Option B		
			rating	weighted rating	rating	weighted rating
<b>STEP 1.</b> Check back to your multiplier card, write the cold numbers in the "multiplier" column.	Useful-first :	0,2	20	80	30	90
<b>STEP 2.</b> Check back to your rating card, write the cold numbers you came up with for its prior respective columns - Option A rating column and Option B rating column.	Security :	0,8	30	90	70	21
<b>STEP 3.</b> Now multiply the multiplier with each rating to get the weighted rating. Add each weighted rate to sum the columns.	Privacy :	0,3	30	70	40	60
<b>STEP 4.</b> Add each weighted rate to sum the columns.	Data-careful :	0,6	30	70	40	30
<b>STEP 5.</b> The column with the most points is the option by which it best aligns with your values and priorities.	Transparency :	0,4	40	60	50	30
<b>STEP 6.</b> How do you feel about this?	Openness :	0,8	40	30	50	24
<b>STEP 7.</b> Look back at your multipliers and ratings: highlight the highest + lowest rating. Ask yourself if either for the other option to be better aligned. Or do you need to create another option altogether?	Sustainability :	0,7	50	30	40	24
	Social Impact :	0,6	40	30	40	24
			SUM	SUM		

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Main Goal	A MORAL ALGORITHM		Key Actions			
			Translate your understanding of these options from rich insights to cold numbers			
	values	multiplier	Option A	Option B		
			rating	weighted rating	rating	weighted rating
<b>STEP 1.</b> Check back to your multiplier card, write the cold numbers in the "multiplier" column.	Useful-first :	0,2	20	4	80	16
<b>STEP 2.</b> Check back to your rating card, write the cold numbers you came up with for its prior respective columns - Option A rating column and Option B rating column.	Security :	0,8	30	24	90	72
<b>STEP 3.</b> Now multiply the multiplier with each rating to get the weighted rating. Add each weighted rate to sum the columns.	Privacy :	0,3	30	9	70	21
<b>STEP 4.</b> Add each weighted rate to sum the columns.	Data-careful :	0,6	30	18	70	42
<b>STEP 5.</b> The column with the most points is the option by which it best aligns with your values and priorities.	Transparency :	0,4	40	16	60	24
<b>STEP 6.</b> How do you feel about this?	Openness :	0,8	40	32	30	24
<b>STEP 7.</b> Look back at your multipliers and ratings: highlight the highest + lowest rating. Ask yourself if either for the other option to be better aligned. Or do you need to create another option altogether?	Sustainability :	0,7	50	35	30	21
	Social Impact :	0,6	40	24	30	18
			SUM	SUM		

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**Exercise 3**

Main Goal: **Algorithmic Feelings**

Key Actions: Translate your understanding of these options from rich insights to cold numbers

A RATIONAL ALGORITHM

	values	multiplier	Option A	Option B		
			rating	weighted rating	rating	weighted rating
STEP 1.	Check back to your multiplier card. Write the cold numbers in the 'multiplier' column.					
STEP 2.	Check back to your rating card. Write the ratings you came up with for each respective columns - Option A, rating column and Option B, rating column.					
STEP 3.	Now multiply the multiplier with each rating. Write the results in the 'rating' column.					
STEP 4.	Add each weighted rate to sum the columns.					
STEP 5.	The column with the most points is the option that is best aligned with your values and priorities.					
STEP 6.	Take your notes! How do you feel about this?					
STEP 7.	Look back at your multipliers and ratings. Is there a clear winner? Insert: and what would need to change in order for the other option to be better aligned? Or do you need to create another option altogether?					
			<b>sum 162</b>		<b>sum 238</b>	

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**Exercise 3**

Main Goal: **Algorithmic Feelings**

Key Actions: Translate your understanding of these options from rich insights to cold numbers

A RATIONAL ALGORITHM

	values	multiplier	Option A	Option B		
			rating	weighted rating	rating	weighted rating
STEP 1.	Check back to your multiplier card. Write the cold numbers in the 'multiplier' column.					
STEP 2.	Check back to your rating card. Write the ratings you came up with for each respective columns - Option A, rating column and Option B, rating column.					
STEP 3.	Now multiply the multiplier with each rating. Write the results in the 'rating' column.					
STEP 4.	Add each weighted rate to sum the columns.					
STEP 5.	The column with the most points is the option that is best aligned with your values and priorities.					
STEP 6.	Take your notes! How do you feel about this?					
STEP 7.	Look back at your multipliers and ratings. Is there a clear winner? Insert: and what would need to change in order for the other option to be better aligned? Or do you need to create another option altogether?					
			<b>sum 162</b>		<b>sum 238</b>	

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**Exercise 3**

Main Goal: **Algorithmic Feelings**

Key Actions: Translate your understanding of these options from rich insights to cold numbers

A RATIONAL ALGORITHM

	values	multiplier	Option A	Option B		
			rating	weighted rating	rating	weighted rating
STEP 1.	Check back to your multiplier card. Write the cold numbers in the 'multiplier' column.					
STEP 2.	Check back to your rating card. Write the ratings you came up with for each respective columns - Option A, rating column and Option B, rating column.					
STEP 3.	Now multiply the multiplier with each rating. Write the results in the 'rating' column.					
STEP 4.	Add each weighted rate to sum the columns.					
STEP 5.	The column with the most points is the option that is best aligned with your values and priorities.					
STEP 6.	Take your notes! How do you feel about this?					
STEP 7.	Look back at your multipliers and ratings. Is there a clear winner? Insert: and what would need to change in order for the other option to be better aligned? Or do you need to create another option altogether?					
			<b>sum 162</b>		<b>sum 238</b>	

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**Exercise 3**

**Math Goal:** **Algorithmic Feelings**

**Key Actions:** Translate your understanding of these options from rich insights to cold numbers

**A MORAL ALGORITHM**

**STEP 1.** Check back to your multiplier card. Write the one digit numbers in the "multiplier" column.

**STEP 2.** Check back to your rating card. Write the ratings you came up with for each value in the "rating" column.

**STEP 3.** Now multiply the multiplier with each rating. Write the results in the "Option A" rating column. To create the respective weighted ratings.

**STEP 4.** Add each weighted rate to sum the columns.

**STEP 5.** The column with the most points is the option to be selected.

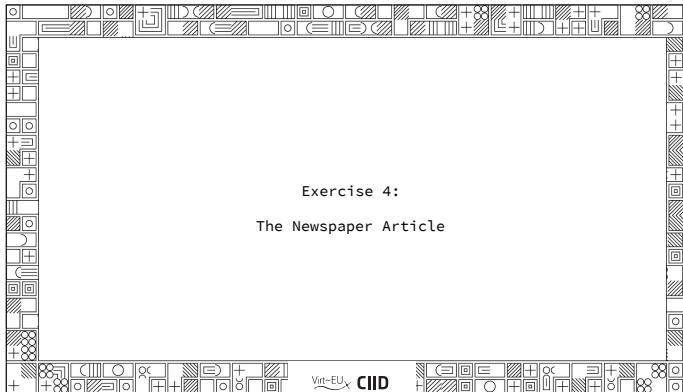
**STEP 6.** Add each weighted rate to sum the columns.

**STEP 7.** Take some pulses: How do you feel about this?

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	values	multiplier	Option A rating	weighted rating	Option B rating	weighted rating
User-first	0,2	20	4	80	16	
Security	0,8	30	24	90	72	
Privacy	0,3	30	9	70	21	
Data-careful	0,6	30	18	70	42	
Transparency	0,4	40	16	60	24	
Openness	0,8	40	32	30	24	
Sustainability	0,7	50	35	30	21	
Social Impact	0,6	40	24	30	18	
		<b>Sum 162</b>			<b>Sum 238</b>	

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**Exercise 4**

**A MORAL ALGORITHM**

**THE DAILY**

December 4th, 2018  
Editorial, Inc.

Bear & Co. \_\_\_\_\_?

It all started with a great idea... a cuddly, fuzzy snuffle who could anyone could use to save the world. They worked together, then things got a little... complicated.

An insider at the Bear & Co. team in New Zealand said that they were considering some difficult decisions as they worked on the cuddly bear. They had to choose \_\_\_\_\_.

They literally weighed their options by the pound. There was some sort of a balancing act between their values and the decision of what to do next. The decision of what to do next was \_\_\_\_\_ important for the team. All of the energy and focus on this decision ended up as a choice where the team decided to \_\_\_\_\_.

Apparently, they explored both options by the pound. The right cost = similar to "real" imagination. Our source tells us that the team decided to find that everyone in the world had the bear, and they got \_\_\_\_\_.

Over here in The Daily newspaper, we are happy to report that their commitment to figuring out the right decision made it a success. Even this space, a student, was keeping an eye on Bear & Co. and all of their friends.

For more success, be sure to do your research. Success is only derive when you do your research.

**CIIID**

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Exercise 4  
A MORAL ALGORITHM

THE DAY

Bear & Co. \_\_\_\_\_?

December 5th, 2018  
Wednesday, 10

It all started with a great idea... a cuddly, fuzzy stuffed animal that could send messages to send voice messages to each other. Then things got a little complicated.

An employee at the Bear & Co. office had been thinking about what they were considering some difficult decisions as they worked on the cuddly bear. They had to choose whether to do this or that.

Apparently, they evolved both species by some special force of eight cost... stellar to Bear & Co. Imagine? Our source said that the team had tried to make sure that everyone in the world had their own and the ... corrected... when they considered the ... weird ... outcome.

Some of their scenarios even showed a ... children's perception of ... love became manipulated ... by bear.

Over here in The Daily Reasoner, we have been ... by their commitment to figuring out the ... stickers ... this week. It will be keeping an eye on Bear & Co. and the rest of their ... kind-hearted friends.

Over here in The Daily Reasoner, we have been ... by their commitment to figuring out the ... stickers ... this week. It will be keeping an eye on Bear & Co. and the rest of their ... kind-hearted friends.

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Share your newspaper articles

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## Agenda

**ARRIVAL**  
Name tags, consent forms

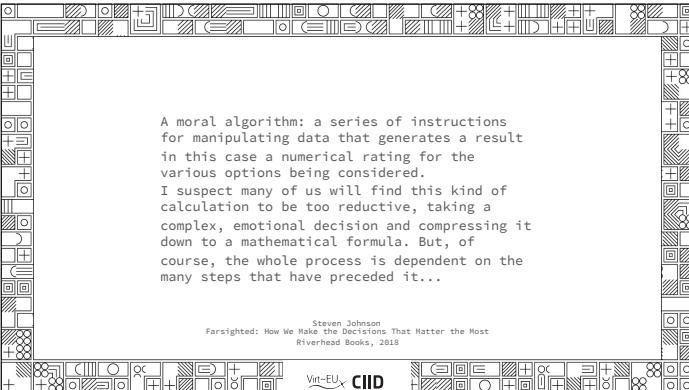
**OVERVIEW + INTRODUCTIONS**  
Internet of Things, Ethics  
Our company + Values  
—short break—

Our company's problem of the day  
A Moral Algorithm

Feedback and Brainstorm

**END**

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A moral algorithm: a series of instructions for manipulating data that generates a result in this case a numerical rating for the various options being considered.  
I suspect many of us will find this kind of calculation to be too reductive, taking a complex, emotional decision and compressing it down to a mathematical formula. But, of course, the whole process is dependent on the many steps that have preceded it...

Steven Johnson  
*Farsighted: How We Make the Decisions That Matter the Most*  
Riverhead Books, 2018

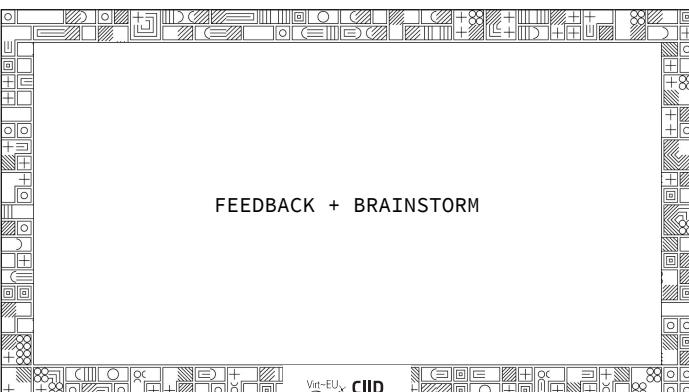
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As the IoT grows in importance — Gartner predicts the number of connected things in use will hit 14.2 billion in 2019, and grow to 25 billion by 2021 — increasing numbers of formerly human-run processes will be automated using devices and algorithms not easily understandable by the folks affected by them in areas such as data ownership, algorithmic bias, privacy, and regulatory compliance.

If many IoT developers and designers are faced with an overwhelming amount of ethical choices and consequences of their developments, we think it's important to try to understand from a developer and designer perspective ethics and IoT is concretely about in the everyday practices of IoT creation. Because only then can we create a set of tools that will help developers deal with some of these ethical issues arising throughout the development process of IoT devices.

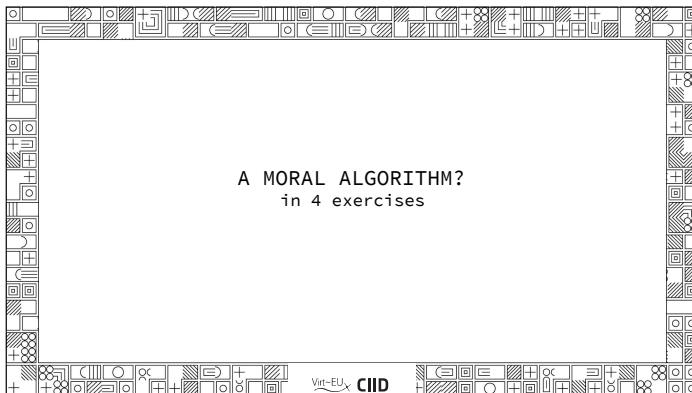
As a developer told me yesterday: 'Ethics starts where the law ends'. And this is where we enter with our tools.

- 
- how did it go? what did you learn?



FEEDBACK + BRAINSTORM

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VALUES

IF EVERYONE IN THE WORLD...

ALGORITHMIC FEELINGS

THE NEWSPAPER

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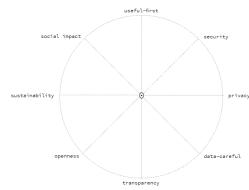
let's discuss each exercise

How might we package this experience in different ways?

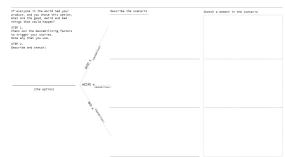
When and where might this be useful in the work of IOT design + development?

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please go around to each board and leave feedback for us?



## VALUES



IF EVERYONE IN THE WORLD...

value	activation	Series 1	Series 2
		rating	negative
		rating	positive
useful-first			
Security			
Privacy			
Data-careful			
Transparency			
Openness			
Sustainability			
Social Impact			
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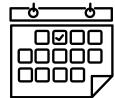
ALGORITHMIC FEELINGS



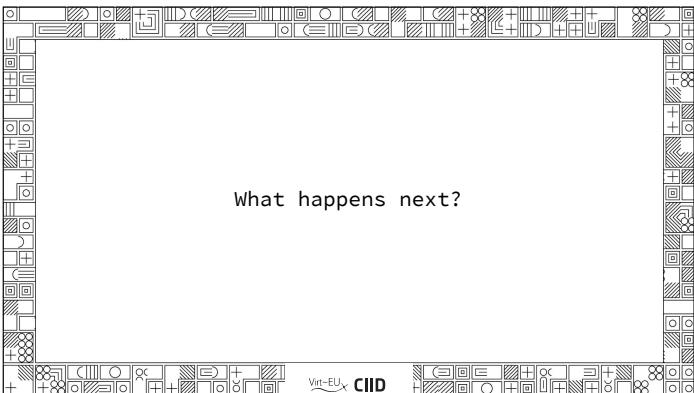
THE NEWSPAPER



How might we package this  
experience in different ways?



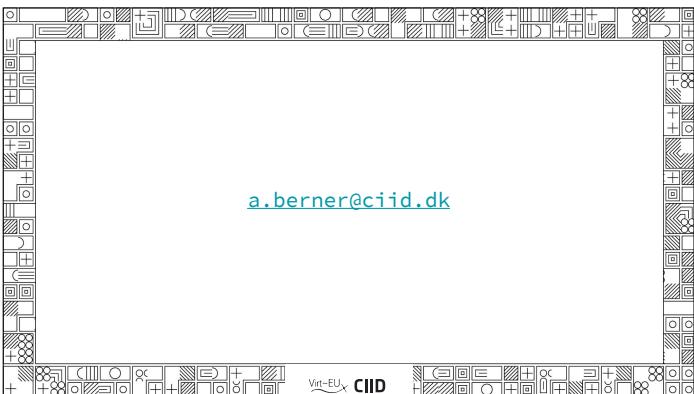
When and where might this be  
useful in the work of IOT design  
+ development?



What happens next?

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- Would you consider joining a group to continue the conversation, review other workshop's inputs, be part of the tools design?