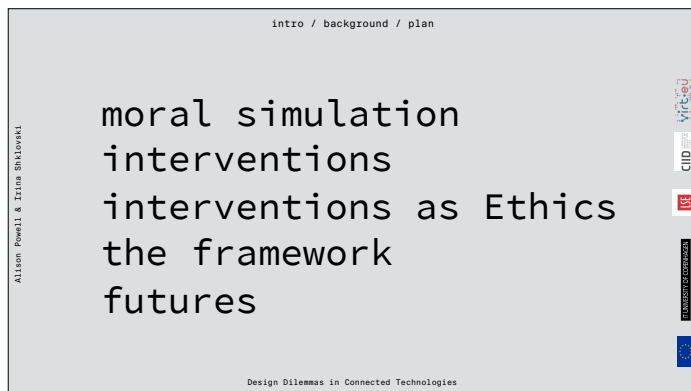


We are Irina and Alison, from ITU and LSE, researchers and professors



## IRINA

Together we have been working on a project to try to understand and then address the gap between the Good intentions of new technology companies and the reality of countless stories of tech gone wrong. We called our project VIRT-EU which stands for Values and Ethics in Innovation for Responsible Technology in Europe. We focus specifically on the design of connected devices and for the last three years we have been working with IOT start-ups. Our goal is to develop tools and means to support developers in learning to think in terms of ethics as they develop new technologies.



## Alison

Today, in this talk, we will introduce you to how we have begun to understand this gap and how we understand the potential of ethics to help creators of new technology to think critically about the products they put into the world. Why creators? Why

We'll start with the worry - what is going on and why do we care? And then transition into the ethics - a way to frame, critique and address the worries. We'll get a little active and then wrap up with some time for Q+A.



[Read the dilemma out loud and explain] Imagine that... we are building a new technology... and it could do this... or this... how do we decide?  
We are now entering a bit of fiction, so feel free to also imagine yourself as a bit of a different person

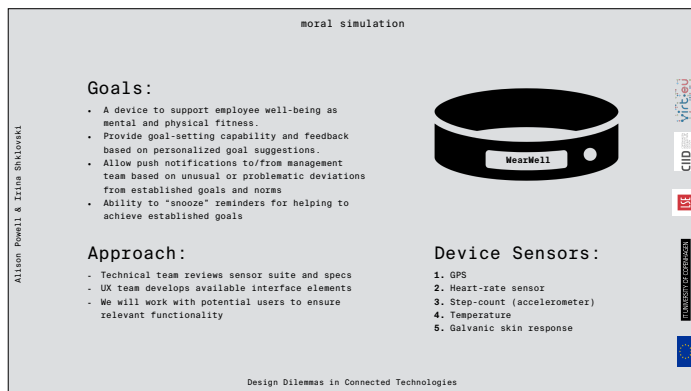


Our company is developing an IoT-based technology, WearWell. With WearWell, our intention is to tap into the employee well-being market. We have defined employee well-being as mental and physical fitness of employees. We hope to market (and sell) WellWear to companies. If a company decides to buy our product, all of their employees would receive our state-of-the-art wearable device (an electronic bracelet) equipped with GPS technology, heart rate sensor, step counting, body temperature. We really worked hard on the range of functionalities of WearWell and the tracking capabilities. As a result, the WearWell bracelet is able to track employees in the workplace, including the restrooms. Our company is able to track the fitness levels through steps and the mental wellbeing through the heart rate monitoring. We've been working on some new features for the wellbeing device as well- we have set a minimum number of steps to ensure that employees understand the level they should try to reach. If employees don't meet the minimum number, the bracelet buzzes. The bracelet's heart rate monitoring allows a company to know when their employees are stressed. If their heart rate is high, employees are required to meditate for at least 10 minutes. If they snooze their meditation alarm for more than 3 times, their line manager gets a notification.



You (the audience) are all part of the team that is building the new wearable device. You're a great mixture of technology developers, designers, researchers and project managers and we are so happy to have you to work on The WearWell! We (Irina and Alison) are the communication managers for our company. We need to decide on a couple of things before we start pitching our product to companies.

First, how should we design WearWell in order to capture the clearest picture of data and empower the companies to make the best sense of the data they collect & generate?



You (the audience) are all part of the team that is building the new wearable device. You're a great mixture of technology developers, designers, researchers and project managers and we are so happy to have you to work on The WearWell! We (Irina and Alison) are the communication managers for our company. We need to decide on a couple of things before we start pitching our product to companies.

First, how should we design WearWell in order to capture the clearest picture of


data and empower the companies to make the best sense of the data they collect & generate?

moral simulation

Alison Powell & Irina Shklovskii

**Measuring impact:**

- Up-take and feedback from employees
- The number of sick days employees take (reduction in the number of sick days would be evidence of positive impact)
- Keep track of the number of interactions between employees and managers
- Keep track of productivity levels (KPIs)



**Security and privacy:**

- Employees will have the option of turning off internal location tracking
- Employees will have an option of turning off tracking on weekends
- Managers and employees will have to confirm some more sensitive tracking options together

**Other options:**

1. other sensors?
2. data storage & management options?

Design Dilemmas in Connected Technologies

CIID  
US  
EUROPEAN COMMISSION

You (the audience) are all part of the team that is building the new wearable device. You're a great mixture of technology developers, designers, researchers and project managers and we are so happy to have you to work on The WearWell! We (Irina and Alison) are the communication managers for our company. We need to decide on a couple of things before we start pitching our product to companies.

First, how should we design WearWell in order to capture the clearest picture of data and empower the companies to make the best sense of the data they collect & generate?

moral simulation

the axis of options

Option	Description
A	Track but store data locally on the device
B	Track but store data temporarily
C	Track but don't share with company Share only with WearWell for A/B testing
D	Full data-sharing Both with company and WearWell

Design Dilemmas in Connected Technologies

Alison Powell & Irina Shklovskii

CIID

US

INSTITUTE OF DEFENSES

EU

As you see, the far left side of the room has been designated as a very confident decision of A and the far right side of the room is for a confident decision B. Anywhere in between is not neutral, but shows that you're not so sure. So everyone who can stand up, stand up, and move to your decision place. If you cannot stand up, but you can move your arms, you can raise a left or right hand. Thank you! Can we hear from [randomly chosen you]? Why do you feel that way? Alright, well, let's see what happens if we try to think through the decision again, but now with a bit more drama, because a newspaper just wrote an article that says \_\_\_ about our dilemma

moral simulation

Option A

Track but store data locally on the device  
Company gets aggregate reports

Design Dilemmas in Connected Technologies

Alison Powell & Irina Shklovskii

CIID

US

INSTITUTE OF DEFENSES

EU

moral simulation

Option B

Track but store data temporarily  
Company gets aggregate reports

Design Dilemmas in Connected Technologies

Alison Powell & Irina Shklovskii

CIID


US

INSTITUTE OF DEFENSES

EU

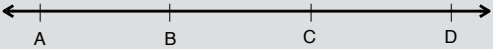
moral simulation

Alison Powell & Irina Shklovskii



## Option C

Track but don't share with client company  
Share only with WearWell for A/B testing  
Company gets aggregate reports




Design Dilemmas in Connected Technologies

CIID  
US  
EUROPEAN COMMISSION


moral simulation

Alison Powell & Irina Shklovskii



## Option D

Full data-sharing with company, WearWell  
and any third-parties that are relevant




Design Dilemmas in Connected Technologies

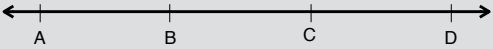
CIID  
US  
EUROPEAN COMMISSION

moral simulation

Alison Powell & Irina Shklovskii



## the axis of options



Track but store data locally on the device

Track but store data temporarily

Track but don't share with company  
Share only with WearWell for A/B testing

Full data-sharing  
Both with company and WearWell

Design Dilemmas in Connected Technologies

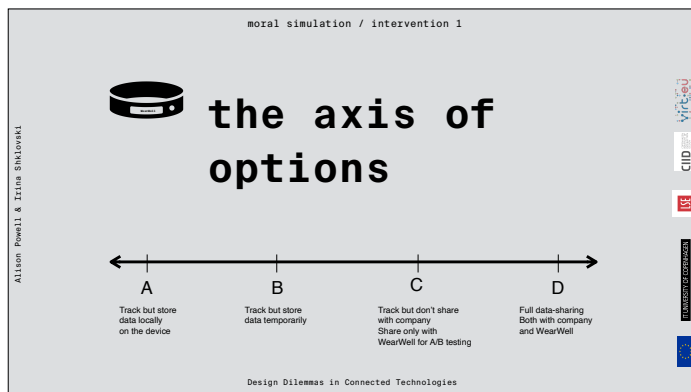
CIID  
US  
EUROPEAN COMMISSION

As you see, the far left side of the room has been designated as a very confident decision of A and the far right side of the room is for a confident decision B. Anywhere in between is not neutral, but shows that you're not so sure. So everyone who can stand up, stand up, and move to your decision place. If you cannot stand up, but you can move your arms, you can raise a left or right hand. Thank you! Can we hear from [randomly chosen you]? Why do you feel that way? Alright, well, let's see what happens if we try to think through the decision again, but now with a bit more drama, because a newspaper just wrote an article that says \_\_\_ about our dilemma



What about privacy? Is it going to allow them to have a right to a private life? But in order to define wellbeing in the clearest way possible, and track how well the employees are doing over time, the device should really collect all of the data possible, otherwise it is showing an incomplete picture and we care about the Whole Self.

Now that you see this, you can move to a different decision or stay put

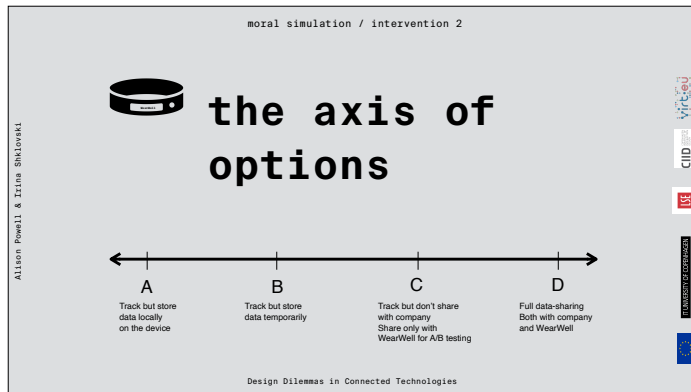


As you see, the far left side of the room has been designated as a very confident decision of A and the far right side of the room is for a confident decision B. Anywhere in between is not neutral, but shows that you're not so sure. So everyone who can stand up, stand up, and move to your decision place. If you cannot stand up, but you can move your arms, you can raise a left or right hand. Thank you! Can we hear from [randomly chosen you]? Why do you feel that way? Alright, well, let's see what happens if we try to think through the decision again, but now with a bit more drama, because a newspaper just wrote an article that says \_\_\_ about our dilemma

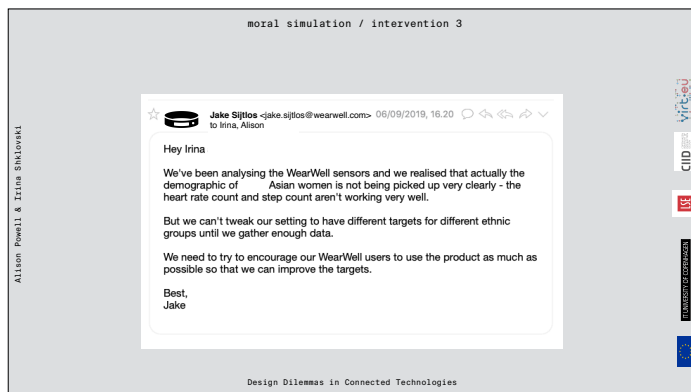


Carolina, tell us about how WearWell is affecting your life these days?

I love WearWell, it's helped me keep a lot of mental clarity on difficult days. I'm also super excited about the new period-tracking feature - I've always had a lot of pain and mood shifts when I have my period which makes it hard to come to work on those days. I've shared my data with my line manager - finally he understands and lets me work from home when I need to. The meditation requirement goes up when I have my period but that's cool - I hear that studies show it helps. Now that you see this, you can move to a different decision or stay put



As you see, the far left side of the room has been designated as a very confident decision of A and the far right side of the room is for a confident decision B. Anywhere in between is not neutral, but shows that you're not so sure. So everyone who can stand up, stand up, and move to your decision place. If you cannot stand up, but you can move your arms, you can raise a left or right hand. Thank you! Can we hear from [randomly chosen you]? Why do you feel that way? Alright, well, let's see what happens if we try to think through the decision again, but now with a bit more drama, because a newspaper just wrote an article that says \_\_\_ about our dilemma



We find out that the heart rate count and step count do not work very well for asian women.

{We think there might a problem. We don't know if the gap in the email was left intentionally or deleted out. Maybe they are referring to Black & Asian women?}

But currently we are unable to tweak our settings to have different targets for different ethnic groups but if we could gather more data we could make the wellbeing targets much better aligned to all of the different ethnic groups represented at our company. Unfortunately, it will take longer for under/represented groups, so their goals and targets all be off for a while longer.

(extra info) In order for asian women to reach fitness, they only have to take 1000 steps a day. But black men require up to 2000 steps a day in order to stay fit. Now that the minimum has changed, they have begun to put on weight.







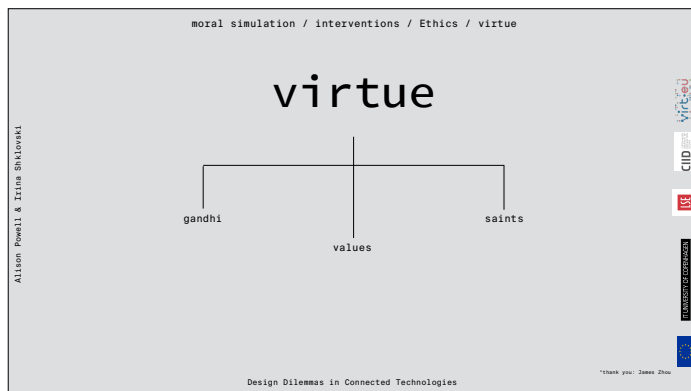
## IRINA

The three main branches of ethics are utilitarian ethics, deontological ethics and virtue ethics.



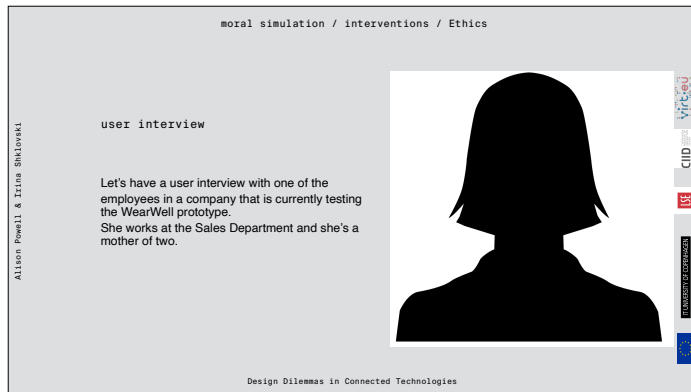
What about privacy? Is it going to allow them to have a right to a private life? But in order to define wellbeing in the clearest way possible, and track how well the employees are doing over time, the device should really collect all of the data possible, otherwise it is showing an incomplete picture and we care about the Whole Self.

Now that you see this, you can move to a different decision or stay put



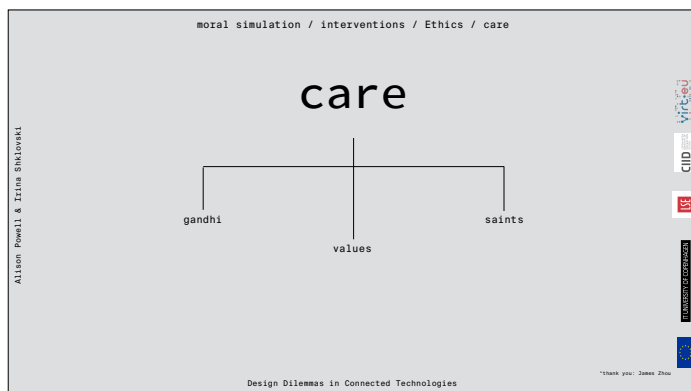
## IRINA

We should strive to become courageous, honest, generous, and compassionate. We should strive to have a good life. We must develop our moral character and demonstrate virtues in our decision making and behavior. This comes down to developing a kind of practical wisdom that allows people to determine how to make choices that will help them further develop as virtuous beings. A virtuous agent knows the correct way to act in various contexts while also desiring to act in such a way. In virtue ethics, we constantly strive to become better people by trying to align with a set of [communally-defined?] ethical values and ethical idols



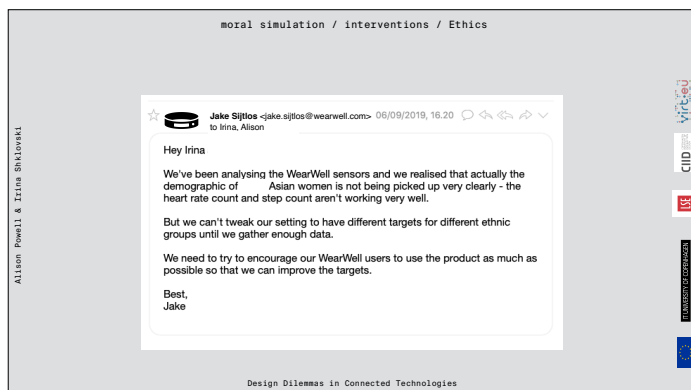
Carolina, tell us about how WearWell is affecting your life these days?

I love WearWell, it's helped me keep a lot of mental clarity on difficult days. I'm also super excited about the new period-tracking feature - I've always had a lot of pain and mood shifts when I have my period which makes it hard to come to work on those days. I've shared my data with my line manager - finally he understands and lets me work from home when I need to. The meditation requirement goes up when I have my period but that's cool - I hear that studies show it helps. Now that you see this, you can move to a different decision or stay put



IRINA

We should strive to become courageous, honest, generous, and compassionate. We should strive to have a good life. We must develop our moral character and demonstrate virtues in our decision making and behavior. This comes down to developing a kind of practical wisdom that allows people to determine how to make choices that will help them further develop as virtuous beings. A virtuous agent knows the correct way to act in various contexts while also desiring to act in such a way. In virtue ethics, we constantly strive to become better people by trying to align with a set of [communally-defined?] ethical values and ethical idols



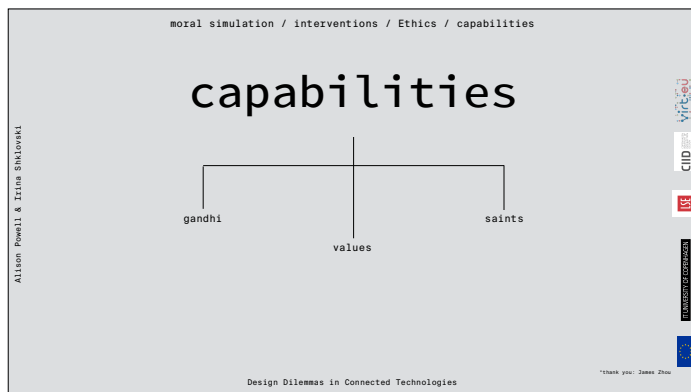
We find out that the heart rate count and step count do not work very well for asian women.

{We think there might a problem. We don't know if the gap in the email was left intentionally or deleted out. Maybe they are referring to Black & Asian women?}

But currently we are unable to tweak our settings to have different targets for different ethnic groups but if we could gather more data we could make the wellbeing targets much better aligned to all of the different ethnic groups represented at our company. Unfortunately, it will take longer for under/

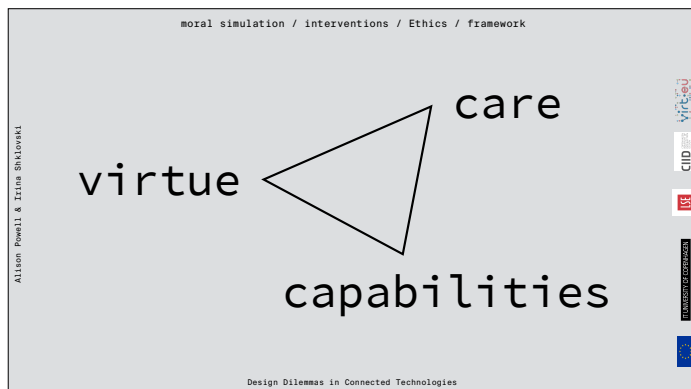
represented groups, so their goals and targets all be off for a while longer.

(extra info) In order for asian women to reach fitness, they only have to take 1000 steps a day. But black men require up to 2000 steps a day in order to stay fit. Now that the minimum has changed, they have begun to put on weight.



## IRINA

We should strive to become courageous, honest, generous, and compassionate. We should strive to have a good life. We must develop our moral character and demonstrate virtues in our decision making and behavior. This comes down to developing a kind of practical wisdom that allows people to determine how to make choices that will help them further develop as virtuous beings. A virtuous agent knows the correct way to act in various contexts while also desiring to act in such a way. In virtue ethics, we constantly strive to become better people by trying to align with a set of [communally-defined?] ethical values and ethical idols



## Alison

and when thinking through capabilities we realise that in fact we can only care about So much, that which is within our capacity to act



So actually these 4 options: data, storage and design came from the 3 theories

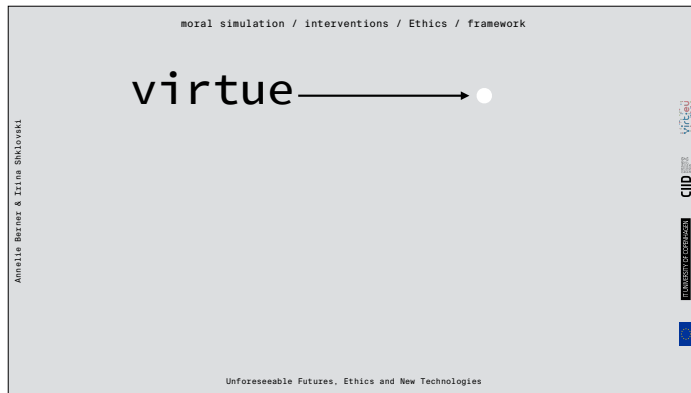
## IRINA

At first we focused on virtue ethics but we quickly realized that the relentless focus on the individual and their internal ideals ignores the structural pressures and constraints placed on the developers we studied.

So we're adding in the capabilities approach and care ethics.

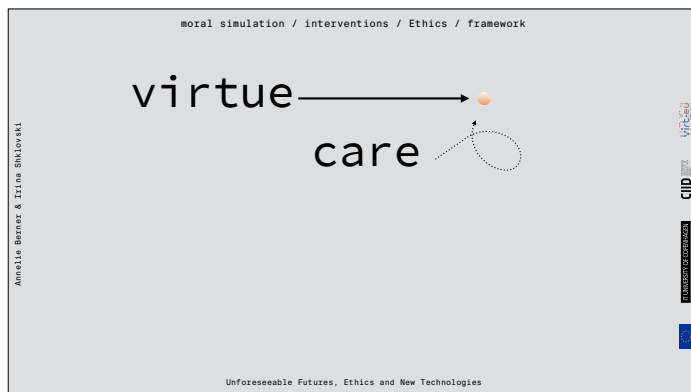
The capabilities approach augments the internally oriented focus of virtue ethics on the moral capacities of the individual, by adding the importance of structural constraints. This assumes, however, that moral virtues and capabilities map out a clear path that ought to be followed. The problem with this view is that even if we might have moral character, our own values and virtues might come into conflict in our decision-making. This is because people are always entangled in a diversity of relations that hold contradictory values and conflicting demands.

Care ethics recognizes that relationships are central to being human because they enable individuals to face uncertainties of the future - together is better than alone. One of the main claims of care ethics is the emphasis on an engaged, active agent that acknowledges that he/she is entangled in a broad web of relationships that require the constant negotiation of disparate and often conflicting demands and obligations. Since it is impossible to care about everything, care is necessarily a selective model of attention and the choice of what or whom to care about is a kind of expression of power. The asymmetric expressions of power, however, are balanced by the fact that caring for someone or something deeply makes us vulnerable.



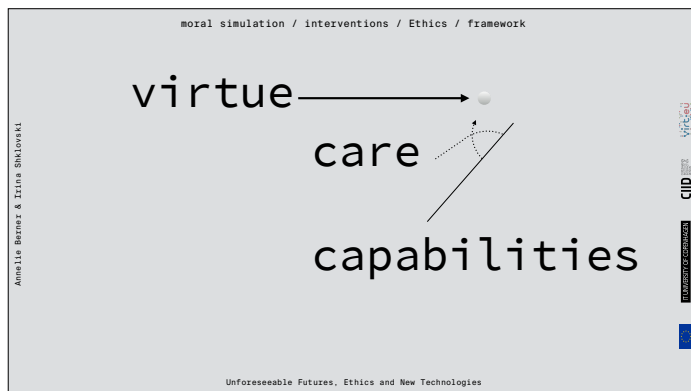
## ANNELIE

so if in virtue we are trying to strive towards goodness (our lovely blue ball of goodness)



## IRINA

when we think through with care ethics we find that the route towards that goodness is actually a bit more complicated



## ANNELIE

and when thinking through capabilities we realise that in fact we can only care about So much, that which is within our capacity to act



Alison

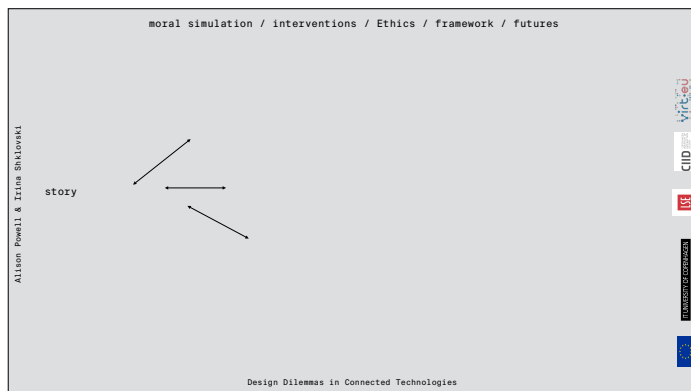
As a starting point to identifying an “opportunity”, challenge, or possible point of intervention



IRINA

But maybe this is all fine? Why do we worry? Why don't we worry? Maybe it will all be ok, maybe we can solve the problems we have created with some more technology? Maybe we should set an AI to figure this out for us eventually? [a few minutes of devil's advocate either between us or with the audience to debate whether we should worry→care at all]

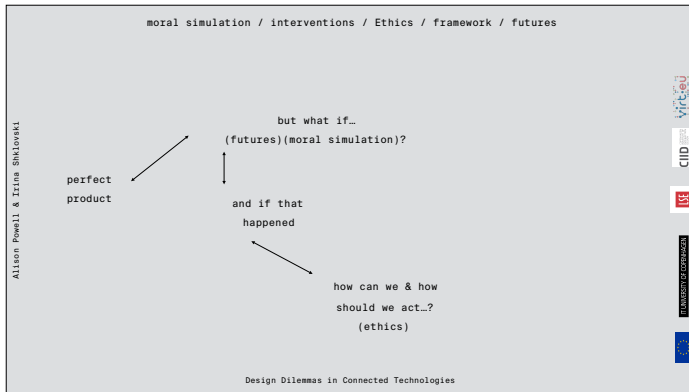
Make sure to touch upon ideas of math deciding what is possible / impossible, lack of critical questioning, lack of thinking through futures



IRINA

So what if we could put on a critical gaze - that would help us work through what might go differently than expected?

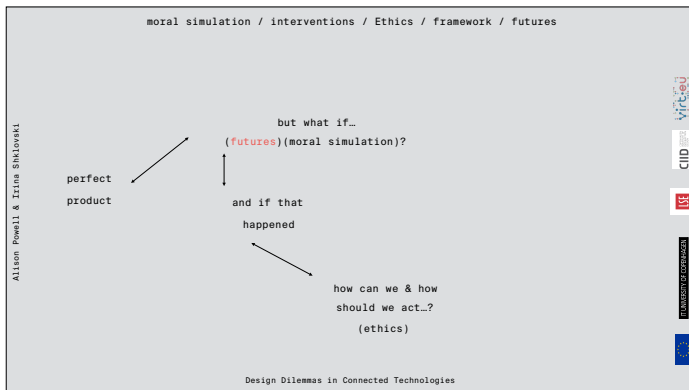
What would that gaze, those lenses we look through be?



Alison

This thing is perfect, but what if... ? If that happens, how should we act?

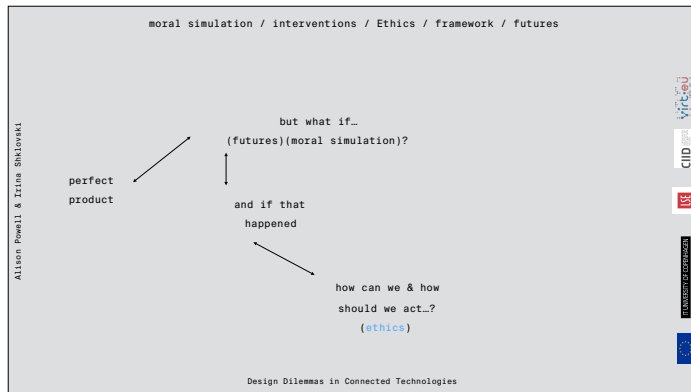
[futures] [ethics]



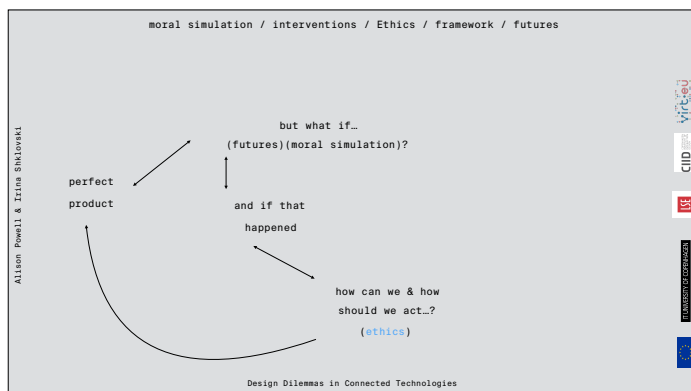
In terms of futures, we can shift our perspective towards the futures, engage our imaginations and ask questions like: What if our product were wildly successful, and everyone in the world had it? What do their lives look like? For example, like the guy that invented the pull to refresh interaction now thinks he broke the world. Or, through research we can identify certain relevant trends and patterns (political, social, economic, environmental, legal) and consider how our product might interact with those trends and patterns, and how things might turn out really well, really badly, or really weird. For example, \_\_\_\_\_ Actually, this kind of alternative path of a product, which can be part of thinking through futures, or speculative design, is also part of practices of thinking through Ethics - these can be “counterfactuals”

These are ways of uncovering surprising or unforeseeable impacts that something that seems perfect could actually have

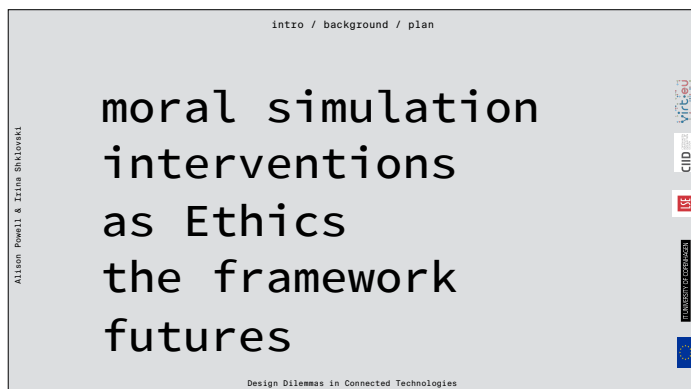




Ethical theories also provide us with a way to critically question our assumptions about a product or the decisions that are made when working on that product. But by the way... keep in mind that while “Ethics” may seem to be an objective or outsider point of view on a piece of technology (it’s not religion! It’s not the government! It’s not Google?!) in fact, every ethical framework will make you see something different about the problem you are dealing with, and comes from a particular place, people, moment in time (mostly ... old white men? Yep)



So we’re going to tell you about a few and then we’re going to get moving, using our brains and these ethics to try to find some worries - no, ethics does not solve things, but yes, it will help us to think critically and find possible (maybe better?) answers



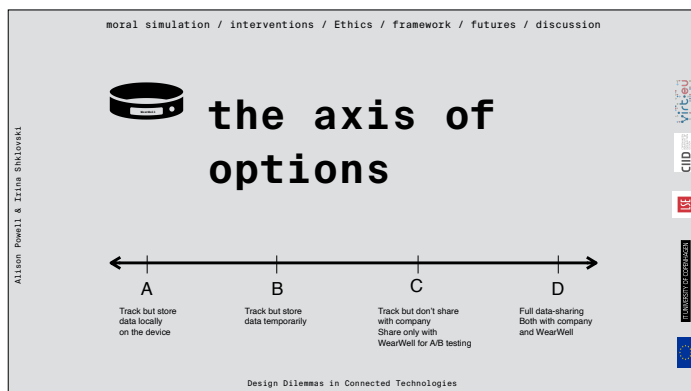
Alison

Today, in this talk, we will introduce you to how we have begun to understand this gap and how we understand the potential of ethics to help creators of new technology to think critically about the products they put into the world. Why creators? Why

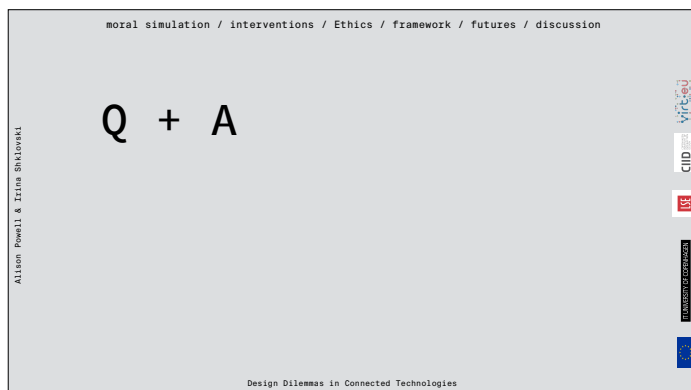
We’ll start with the worry - what is going on and why do we care? And then transition into the ethics - a way to frame, critique and address the worries. We’ll get a little active and then wrap up with some time for Q+A.



So today we thought through a decision from the point of view of the tech creators, when using different ethical theories as intervention points for new questionings, we positioned the tech-ethics worries, discussed how ethics could help us foresee unforeseeable impacts of what new technology could do That was a lot to process. We hope you learned something new. Anyone have a reflection or question?



Now that we have explained the back story of this, we would like to ask you what you think about the axis of options.



As a starting point to identifying an “opportunity”, challenge, or possible point of intervention



This talk and exercises all come from the VIRTEU project, which is coming to websites near you in December of this year. Tickets are free :)  
Please stay in touch!

