COURSE BOOKLET

DO NO HARM
ETHICS FOR DRONE DATA PROJECTS

FRAN MEISSNER, MICHAEL NAGENBORG, BRIAN K. MASINDE, ROGERS ALUNGE, UNICEF, ADDA

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Disastrous Information: Embedding “Do No Harm” principles into innovative geo-intelligence workflows for effective humanitarian action.

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AUTHOR(S)
Fran Meissner; Michael Nagenborg; Brian Masinde; Roger Alunge; UNICEF; ADDA

EMAIL
f.meissner@utwente.nl

POSTAL ADDRESS
P.O. Box 217
7500 AE Enschede

WEBSITE
www.utwente.nl/

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PREFACE

Welcome to this course on ethics for drone data projects.

This PDF file allows for the course to be followed when internet connectivity is low and it is not possible for your to follow the course on the ADDA course hub or the geoversity.io learning platform.

In the units that follow we will explore different aspects of the drone data project life cycle and how ethics play a role in them.

The focus of this course is on showing you how to ask critical questions about projects you are working on. We will give you tools that will make you aware of and help you recognise and mitigate ethics concerns.

In the first unit we discuss basic ethics concepts and concerns, in the second unit we will discuss the drone project life cycle and highlight some key ethics concerns that are well known and always need attention.

In units three to five we dig deeper into what some of those concerns mean in practice and we will give you some tools for continuously engaging with ethics. Unit six will summarise and repeat key learning points.

The exercises in the opening unit assume that you have never taken any ethics courses. Even if you have taken such a course, we recommend that you do the exercises to refresh your basic awareness of technology ethics.

The final unit of the course is designed to give you the opportunity to review and consolidate what you learned throughout the course.

While the course is designed to be modular – meaning you can chose the order in which you follow the core units and decide whether to skip some exercises and lectures – we recommend taking the course in its entirety to ensure the best possible learning.

Learning Outcomes

At the end of the course you will be able to:

1. **Link** relevance of ethics to drone data supported projects
2. **List** key ethics concerns in designing a drone data supported project
3. **Recognise** multitude of stakeholders effected populations and material objects in Drone Projects
4. **Explain** key principles of ethics by design in relation to the Drone Data Project life cycle
5. **Differentiate** how decolonial and intersectional lenses reframe ethics concerns in humanitarian work
6. **Critique** existing projects (including projects labelled ‘ethics proof’)
7. **Outline** possible unintended consequences of the use of a particular data technology
8. **Plan** project processes with ethics evaluations throughout the project life cycle

Assessment Overview

Your understanding of the course material will be evaluated through quizzes, practical exercises, and reflective tasks focused on the ethical considerations of real-world drone projects. Each unit includes activities to assess your comprehension and application of key topics. This PDF Version of the course contains, lecture transcripts and exercises, as well as an annex with exercise answers. In this way you can use this booklet for independent learning, giving you the opportunity to complete exercises in the main part of the booklet to then easily cross-check your learning with the annex.

Get to Know Your Teachers

The course focus and learning outcomes were co-developed with ADDA and UNICEF staff who have provided feedback throughout the production of course materials. The teachers who delivered the learning materials and lectures are:

Dr. Fran Meissner is Assistant Professor in critical geodata studies and geodata ethics at ITC. She is an interdisciplinary social scientist whose research focuses on critically assessing the global economy of geospatial technologies and the local urban impacts of such technologies. Through her research and teaching, she aims to strengthen a more reflexive geoscience.

Dr. Michael Nagenborg is an Associate Professor at the University of Twente's Philosophy Section. He has been involved in multiple research projects on the ethics and politics of disaster management as well as the ethics of robotics and information systems. His current research is located at the intersection of Philosophy of Technology and Philosophy of the City, with a special focus on remote sensing and mapping.

Brian Masinde is a PhD candidate in accountable geo-intelligence at ITC. He has a master's in Statistics and Machine Learning. Brian's work focuses on the ethical and responsible use of geodata and AI in humanitarian disaster risk management, particularly on privacy and biases.

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UNIT 1: INTRO TO DRONE ETHICS

In this course, you'll explore the ethical challenges of drone data projects, from design to impact. You'll learn to spot key concerns, consider diverse stakeholders, apply ethics-by-design, and critique projects—including "ethics proof" ones—while using decolonial and intersectional perspectives to ensure responsible and thoughtful decision-making.

After completing this unit you will be able to:

Link relevance of ethics to drone data supported projects

LECTURE: WHAT IS ETHICS AND WHY IS IT IMPORTANT?

Transcript – What is ethics and why is it important?
Lecturers: Michael Nagenborg and Fran Meissner

Fran Meissner: Welcome back everyone. Many of you have already engaged with ethics, so this video lecture is optional. But if you haven't heard about ethics at all, I think this is a perfect moment to engage with the question of what is ethics and why should it matter for drone projects.

The perfect person to help us with that is Michael Nagenborg, because Michael is an Associate Professor of Technology Ethics. So, Michael, what is ethics is about and why is it important for drone projects?

Michael Nagenborg: Well, let's maybe first start with ethics. Ethics is about what people do and especially how we evaluate human actions. So we might be, for example, upset about something somebody is doing like, you should not do something like that to a person. Or you might feel ashamed about something that you have done in the past. And ethics is dealing with this kind of different, difficult questions where you feel like, okay, we should have ideas about how to guide our actions, how we evaluate actions. And that is what ethics is about as an academic discipline.

Fran Meissner: Okay, so ethics is about deciding what's good and what's bad?

Michael Nagenborg: In a sense, yes. It's also about getting an idea and having a discussion about what is good. Because one of the big pitfalls that we have in contemporary societies, is that we think that good is just a subjective thing. It's about what makes you feel good. And you cannot really have a discussion about it because everybody decides by themselves what is a good thing and what is not a good thing.

Philosophers tend to disagree and say, no, we can have serious discussions about why this is a good technology and that might not be a good technology. So that's really also a link then to drone ethics,

the question of how is this technology being used? And is it really good that what the project is doing?

Fran Meissner: Because sometimes you might have projects that are claiming to be good, but later on we find they really weren't that good for the people that they were supposed to serve?

Michael Nagenborg: Yeah, exactly. Yeah, exactly. And also to understand what kind of new actions, activities can emerge with a new technology like a drone. So drones are still rather new thing, right? So it's not that bad. They have not been used forever in humanitarian actions. Okay. So we need to carefully understand how does this change the field of humanitarian aid if you bring in a robotic device with a lot of sensors attached to it. How does this help us to realize humanitarian values? How does this help us to fulfil the humanitarian mission? And how we should relate to the drones? And how to people, drones change also how we interact with people, right?

Fran Meissner: Right. Right. Now values, you said the word values. Can you maybe give us a little bit of an explanation on that? Because it's not always clear what values are.

Michael Nagenborg: I can give you a full lecture on that. But maybe that's a little bit too much for now. Just a small one. Okay. So in philosophy, we started with the idea that we should focus on rights and we should have clear rules. The big problem with rights and rules is that they do not really motivate people. So, of course, European philosophy, somebody like Kant would say this is rational. This is great. People want to do rational things.

Most of us are not that easy to motivate. So the idea was, okay, what are the ideas that we are striving for? What motivates us in guiding our actions? So, for example, creating justice. Who doesn't want to live in a just society? Who wants to not overcome unfair treatment of people? Who does not want to grant autonomy to others and respect others? So that is what we are talking about when we talk about values, these kind of things that motivate us and help us to guide our actions in a positive sense.

That's also, I think, quite important because ethics is often reduced to don't do this, don't do that. But with values the question is about, in what kind of society do you want to live? So the assumption is we can have that discussion by debating values.

Fran Meissner: You say what society do we want to live in? Is there maybe another aspect, the historical embedding of things? How does ethics relate to understanding the specificity of the sort of situation, of the context?

Michael Nagenborg: Yeah. So there's a long ongoing debate in philosophy if we are opting for universal values that apply everywhere, regardless of the time and the place that you are in. And there's a more of a contextual approach to say, okay, what does this mean in this particular context, in this particular situation that we are in?

I personally am more in favour of the latter. So actually, I would like to understand what does this mean if we talk about, let's say, privacy in a drone operation in Mali. Because privacy actually is a European value. People claim it is a global value. But what actually does this mean for the people on the ground? What kind of information do we want to share? Is it about information sharing? How can we do justice to that?

So that kind of discussion could also be part of ethics. But ethics, for me, is also about opening up this reflective space to take a step back and to say, okay, what are we looking at here? What are we

actually doing here? And what are the underlying principles that are guiding us? Or what are the values we could try to realize here?

Fran Meissner: Good. So what I'm taking away from that is that it's not always obvious or clear what kinds of values are being adhered to. So sometimes that requires critical questioning. But also at the same time, and I think I agree with you there, ethics is quite often something that is best thought about within the context where it is used. So many of the exercises that we're going to have in this course are going to ask you the learner to reflect on your own work or work that you are familiar with. So hopefully that will help you really engage with ethics in context.

QUIZ: ETHICS CONCEPTS

How well do you understand the key ethics concepts we reviewed in the lecture "What is Ethics and why is it important?" Take this quiz to find out!

Multiple Choice, choose the most appropriate answer and then check your answers with those in the annex.

1. What is Ethics?
    a. Ethics, as a discipline, focuses on evaluating human actions.
    b. Ethics is about following the law.
    c. Ethics is about what is socially desirable.
    d. Ethics is about making drone projects look better to outside investors
2. What are Values?
    a. Values are easily defined principles that naturally guide our actions.
    b. Ideals that motivate our actions and guide our actions in a positive manner.
    c. Values indicate how much a decision is worth.
3. What does doing contextually sensitive ethics entail?
    a. Accepting the value structure of a particular place.
    b. Analysing the how specific projects have underlying principles and how these shape the project.
    c. Assuming that values are always relative and only applicable in a particular context.

READING: ETHICS IN TECH PRACTICE

Now that you are familiar with basic ideas about ethics it is time to dive deeper and learn about the idea of **technology ethics**, why it **matters**, what some **key concerns** are and what has been identified as **barriers to a more effective use of ethics** in the technology domain.

We have chosen an accessible summary reading for you that you can find on the website of the Markkula Centre for Applied Ethics.

The text we want you to read was authored by Shannon Vallor, Irina Raicu and Brian Green and it does exactly what its title suggests, it gives you an overview of Ethics in Tech Practice.

Enjoy reading and deepening your learning.

Vallor, S. Raicu, I. and Green, B. (2024) *Overview of Ethics in Tech Practice*. Markkula Center for Applied Ethics. https://www.scu.edu/ethics-in-technology-practice/overview-of-ethics-in-tech-practice/

The website of the Markkula Centre contains a lot of additional useful resources for practicing ethics in technology projects. Feel free to go the extra mile and explore the website after finishing the assigned reading. Once you have finished the reading go to the annex to compare your reading notes with ours.

UNIT 2: ETHICS AND THE DRONE DATA PROJECT LIFECYCLE

After completing this unit you will be able to:

List key ethics concerns in designing a drone data supported project,

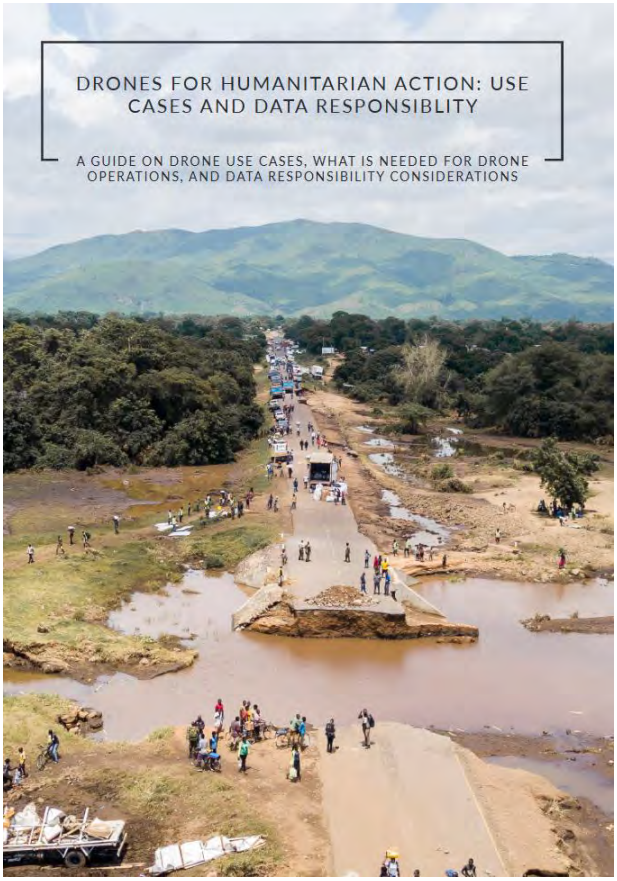
and

Recognise multitude of stakeholders effected populations and material objects in Drone Projects

READING: A DRONE DATA PROJECT LIFE CYCLE

A key message of this course is that ethics are important throughout the drone data project life cycle. This short reading will help you get familiar with the different stages of drone data workflows.

During the introductory unit you learned what ethics is about. Ethics cannot be addressed with a simple ethics evaluation at the start of a project but matters throughout the different stages of using drone data for research. To learn about those different stages read about the standard workflow of drone data projects in the booklet 'Drones for humanitarian action: use cases and data responsibility' (p. 6-7).



Link to document:

https://zenodo.org/records/10682493 (open with chrome browser)

Take notes and think about what ethics concerns might arise in the different stages of the drone data project lifecycle. We will ask about this in the next exercise.

TIP: Especially if you are new to drone data projects you may want to take the time to read the entire booklet which clarifies terminology used in drone data projects, gives examples of drone use in humanitarian interventions and provides insights into key principles for responsible data use, that we will also touch upon in the following units.

ETHICS THROUGHOUT THE DRONE PROJECT LIFE CYCLE

Now that you have a better idea of the different stages of the drone data project life cycle you probably already know a number of ethics concerns linked to those different stages and who relevant stakeholders are. Note down what you already know in the table below. Don't worry if you cannot yet name ethics concerns for each stage of the lifecycle or are unsure about stakeholders. We will ask you to come back to this table later in the course.

DDP Lifecycle Stage	Relevant Ethics Concern	Stakeholders to Consider
Planning		
Drone Operation		
Data Collection		
Data Processing		
Data Analysis		
Data Dissemination		
Data Management and Sharing		

LECTURE: DRONE DATA PROJECT ETHICS CONCERNS

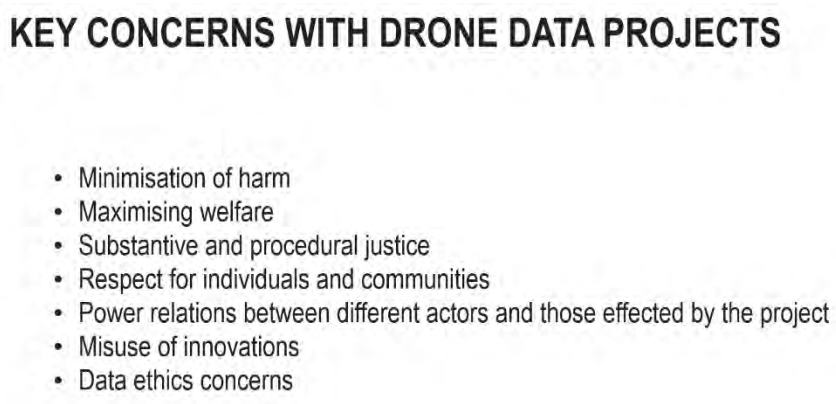
In the below transcript you find a conversation between Dr. Michael Nagenborg and Dr. Fran Meissner. They discuss common drone data project ethics concerns.

Keep notes while reading the transcript. Use the notes to go back to the previous exercise and check the table you have been developing there. Are there concerns that you had not yet thought about? Where in the Drone Data Project lifecycle do they matter? Do these new concerns change who you thought are important stakeholders that might be affected negatively by the project? Keep adjusting the table as you move through the remainder of the course.

Transcript – Drone data Project ethics concerns
Lecturers: Michael Nagenborg and Fran Meissner

Fran Meissner: Welcome back everyone. It is again me, Fran Meissner I am here with Michael Nagenborg. We are going to be talking to you more definitively about questions and key concerns that are out there around drone projects that also do data analysis. So, drone projects that collect and analyse data.

As we've discussed, it is important to think about the drone project life cycle rather than simply thinking about the project at the start and at the time when it was finished. So, when we're looking at the literature and the two references that we have on the slide [on the right], then there's a few key concerns.



Building on: Wang, Ning, Markus Christen, and Matthew Hunt. 'Ethical Considerations Associated with "Humanitarian Drones": & Kochupillai, Mrinalini, Matthias Kahl, Michael Schmitt, Hannes Taubenbock, and Xiao Xiang Zhu. 'Earth Observation and Artificial Intelligence: Understanding Emerging Ethical Issues and Opportunities'.

Let's just have a quick look at what they are. So, there is minimization of harm, maximizing welfare, substantive and procedural justice, respect for individuals and communities, power relations between different actors and those affected by the project, as well as a misuse of innovations and data ethics concerns. So, that's a pretty big list and it's getting somewhat longer when we're thinking about AI also being increasingly implemented. And we'll talk about all of these to a degree in other parts of the course. But Michiel, let me ask you, how do we consider this idea of minimization of harm? Where does it come from in the ethics discussions?

Michael Nagenborg: The minimization of harm is a discussion we often have in the context of risk, for example, but also in the idea of everything is okay, your freedom is only limited if you harm others. The tricky part here is, once you start to dig a little bit deeper, to think about, okay, who actually decides what harm is and what are good criteria for harm. Just to give you an example of a philosophical debate, it's not clear if self-harm actually constitutes harm, because harm is normally

something that is undesirable. But if you harm yourself, then you desire to harm yourself. So, as a philosopher you might debate, is there harm or not? But, this is more the abstract debate.

The question is also, do you have to take into account environmental harms, harms to animals, what constitutes harm in terms of cultural appropriation, for example. So, there's a lot to be said about, okay, we all agree that you should not do harm to somebody or something, but then we have to think through where actually is the boundary line, where does harm begin? That is a quite tricky one, I would say.

Fran Meissner: Okay. So, this kind of also links together with this idea of maximizing welfare with the kinds of projects that are being done.

Michael Nagenborg: Yeah, exactly. Yeah. And then also to think about, okay, maybe I need to do some harm in order to achieve some good. And then the question is, okay, how can I come up with a balance?

I don't like the balancing term here, but how can I make a reasonable decision about if this harm is acceptable? Let's say this does a bit of environmental harm, but the overall benefit is much bigger than that. So, yes, indeed, that is often where harm plays a role and where well-being plays a role.

Fran Meissner: That's quite often the way that utilitarian kinds of ethics are described, right?

Michael Nagenborg: Exactly. If you maximize the benefits, then you can ignore a little bit of harm being done.

Fran Meissner: Okay. So, that's usually also set in contrast to things where you focus in on values and principles around how you make decisions.

Michael Nagenborg: Yeah, but that is a quite a tricky task in the context of, for example, disaster relief. Because it's very tempting to say, but we help people. So, we need to do whatever we can. And we clearly don't care about the data rights at this point when they are suffering. So, I think that is where it gets really, really important to understand, okay, what is at stake here and what are the long-term consequences, even in such dire circumstances.

Fran Meissner: Okay. So, this is really where the ethics reflection comes in. So, let's have another look at those key concerns there. Okay. So, now, there's also been concerns about substantive and procedural justice. Yeah. I mean, we've used the term justice a lot, but it's not that easy of a term, right?

Michael Nagenborg: No. It's actually, even in the antique times, philosophers started to ask the question, okay, what actually is justice? So, it's something we desire, but it is hard to explain. Now, the distinction between substantial and procedural justice is a little bit newer, I would say. And I think it's quite interesting debate to have. So, on the one hand, you have a substantial account that

basically tries to determine how much of x does everybody in a group need? So, how should money be distributed or how should access to the healthcare system being distributed in a society? And what you are looking at is a good criteria where you would say, okay, this is enough or this is good access to healthcare.

Now, procedural justice comes in because the way that substantial justice is being addressed is often through procedures. So, you have to think about what are the mechanisms and how they can distribute things. People who are strongly in favour of procedural justice say, but actually we completely ignore the outcome. We think about what is a good procedure. And a good procedure could be something that is not biased towards certain ethnicities, that is not biased because of genders. It has fair representation. Everybody has a voice. And if we have that kind of arrangement, then we will accept whatever the outcome will be as just because we consider the way we achieved it as just. So, the beauty of that is that it's often far more concrete than the kind of integration that you have when you talk about who will get access to what. Okay.

Fran Meissner: Right. So, there's the substantive part that is who gets what. And then there's the procedural part, that is how should people get what?

Michael Nagenborg: Yeah.

Fran Meissner: And now let's have another look there. We have also this idea of respect for individuals of communities and concerns around power relations between different actors and those affected by the project. Did you want to comment on that?

Michael Nagenborg: Maybe let’s just go back to the question of justice because to have a debate on what is justice is one thing. But this often plays a role if you feel they are treated unjust so that it's unfair how they get access to healthcare or how their data is being used or who claims the ownership of something. And that immediately also links to the question of respect for individuals in communities.

So, who actually will have a seat at the table when these things are being discussed? Who can make their voices heard? Who can make these claims of who decides what is fair, what is unfair? That all plays in, I think, into respectfully engaging with communities because communities might have very different standard for what is just and what isn't just. So, there might be multiple forms of justice, mind-blowing, but that might happen.

Fran Meissner: Right. Well, let's have a final look [at the slide above] then. So, we have this idea of misuse of innovations in data ethics concerns. That's part of the course and we'll expand on this extensively, actually a full unit. But what's this idea around that, I mean, we can talk about data ethics all night long, but if you were to explain it in really simple terms.

Michael Nagenborg: Well, it's basically a focus on what we do with data and who is allowed to do what with data.

Fran Meissner: So, the idea that you kind of have moral discussions around what it is okay to do with data.

Michael Nagenborg: Yeah. And also the question of who should have access to what kind of data, who is entitled based on what rights, who is allowed to share data, is there an obligation to share

data maybe? Or what are the limits to that? So, for me, it's a very specific field that is rooted in the larger discussion, mostly on technology ethics. But we focus on this kind of data questions, I would say.

Fran Meissner: Sometimes, I guess, also a lot of these debates really conflict with this overall idea of more data is always better and that's something to consider when going into thinking about drone projects. So, for now, what we'll leave you with is some reflections on some of the terminologies that we've now discussed and the ability to check out the references that we've provided [above and in the following]. Thank you for listening and engaging with this lecture.

Remember after reading this Transcript return to your Ethics Throughout the Drone Data Table and add and adjust that table before moving on to the following reading exercise.

READING: DRONES IN HUMANITARIAN CONTEXTS AND ROBOT ETHICS

Do you want to expand your knowledge about typical ethics concerns with drone data projects further? Read what Aimee van Wynsberghe and Tina Comes found when they considered the ethics of humanitarian drone projects through the lens of 'robot-ethics'. The article is not focused on the entire drone data project life cycle. It does offer important food for thought in assessing ethics concerns during the project conception phase. While reading the text keep notes about central points made – in the next step you will be able to compare your notes with the ones we took by checking this exercise in the annex:

Van Wynsberghe, Aimee, and Tina Comes. 2020. 'Drones in Humanitarian Contexts, Robot Ethics, and the Human–Robot Interaction'. *Ethics and Information Technology* 22 (1): 43–53. https://doi.org/10.1007/s10676-019-09514-1.

If you are pressed for time, start reading on page 45 with the section: 'The ethics of drones in the humanitarian space'.

Mini Quiz – Multiple Choice, which answer is correct:

1. In the context of humanitarian interventions, what is a significant concern for ensuring ethical projects?
    a. The high cost of deploying Drones in disaster zones.
    b. The technical challenges with operating drones in remote areas.
    c. The risk of reducing human-to-human interaction, which may lead to a loss of contextual understanding and empathy

Check the Annex to see if your answer is right.

UNIT 3: ETHICS BY DESIGN

After completing this unit you will be able to:

Explain key principles of ethics by design in relation to the Drone Data Project life cycle.

LECTURE: INTRODUCTION TO ETHICS BY DESIGN

One approach to proactively engage with ethics in technology and data projects is to adopt a so called Ethics By Design approach. In the following lecture **Dr. Michael Nagenborg** will explain what it means to design for ethics and highlight some key principles for making this possible.

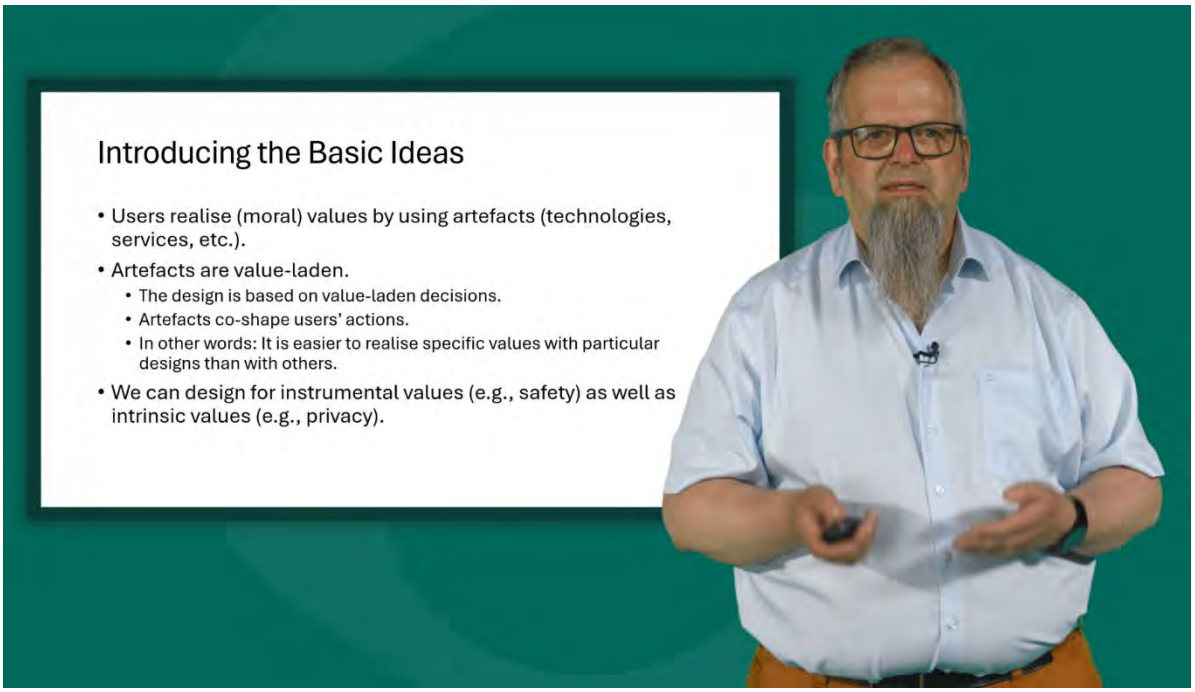
While you listen to the lecture take notes on what those principles are, and experiment with the flip cards below the video to check if you missed any important principles.

Lecture Transcript – Introduction to Ethics by design

Lecturer: **Dr. Michael Nagenborg**

Welcome to our micro-lecture on value-sensitive design. In this lecture, I will give you a basic introduction to some of the underlying ideas of value-sensitive design, VSD for short.

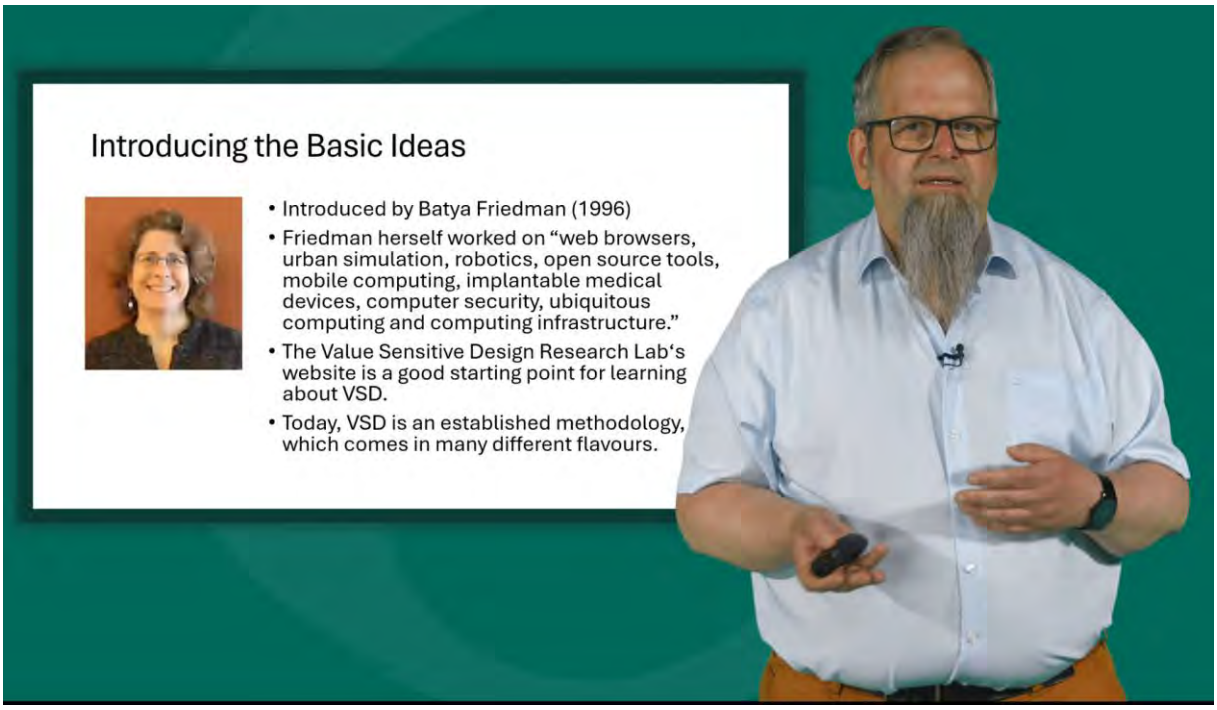
After that I will focus on the specific challenge of translating values into design requirements. Finally, we'll also talk a little bit about the limitations of VSD.



Let's begin with the basic ideas. In value sensitive design, we assume that users will realize moral values by using artifacts. So we are using technologies or services in order to promote justice, to protect privacy, to create safety. Artifacts therefore are value-laden in at least two meanings of the word. On one hand, the design is based on value-laden decisions. So the technology can be designed in different ways. We have to choose for one alternative. And one alternative might be better in promoting a certain value than another. And the artifacts also co-shape users' actions, which sounds pretty complicated, but basically just means that certain artifacts are better in promoting the realization of certain values than others.

One important thing to remember here is that you do this all the time when you're engineering for technology. You always start to realize instrumental values like safety, cost efficiency. But at the same time, you can also do the same thing for moral values like privacy, autonomy, respect. And so on.

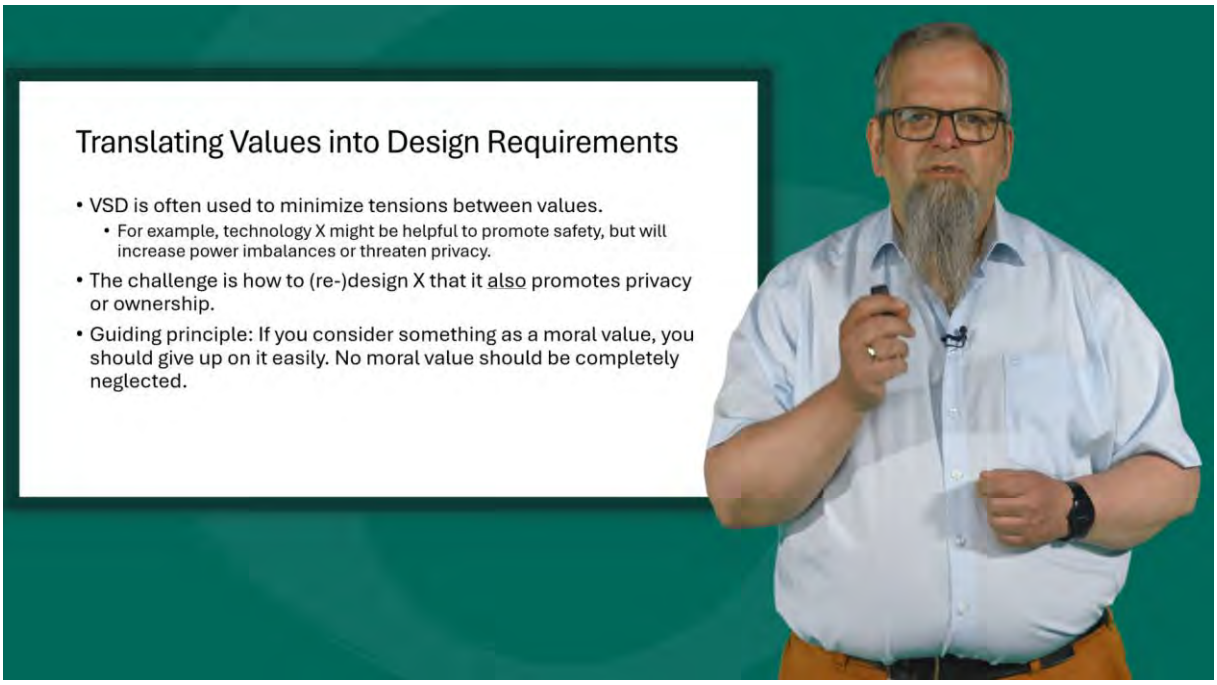
So value sensitive design is a proactive way of doing ethics, which I find very enjoyable because it frontloads ethics, but it also means that we shift from what we shouldn't have done to what are we striving for. What do we want to realize with this technology? How can we make a positive impact on society? The nice thing is also that we can apply VSD retrospectively, so it's not only forward-looking, but you can also use it in order to look back. And I will come to that towards the ending of my lecture.



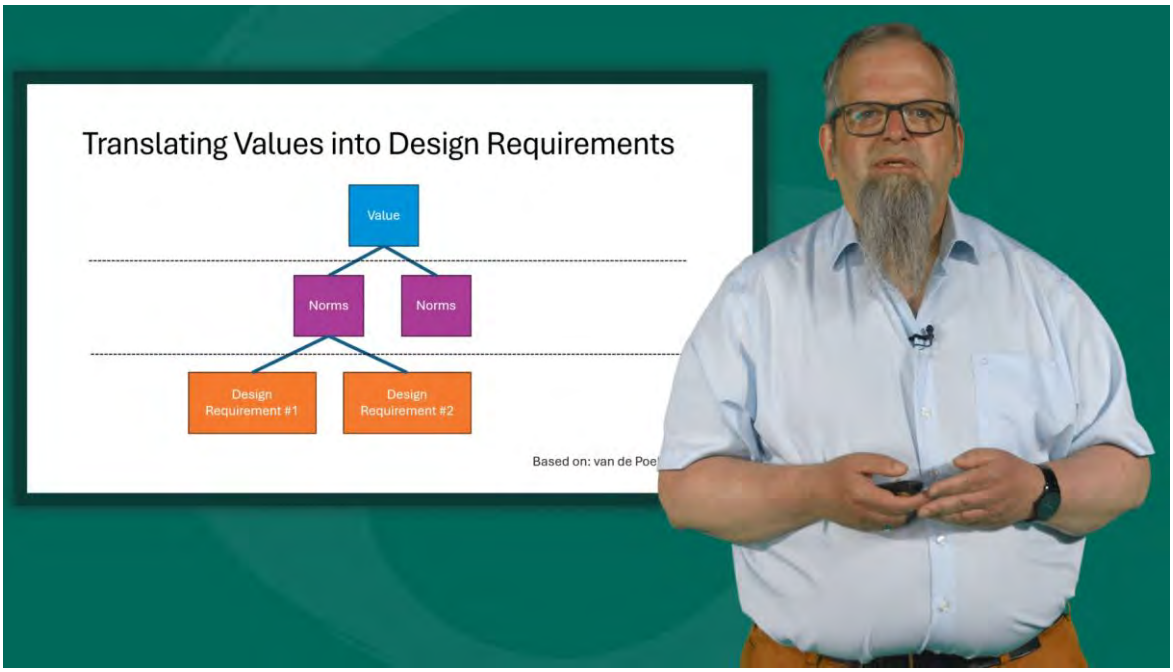
VSD has been introduced by Batya Friedman, who is rooted in human-computer interaction. And she actually already used very sensitive design for a couple of technologies. You'll see here in web browsers, urban simulations, robotics, so it's a really a sprawling field, it has been taken up a lot and actually proved to be quite helpful.

If you want to get started, I still consider the value sensitive design research lab wonderful starting point to get an overview about what value sensitive design can do. Today, there is an established methodology. There are a lot of discussions of VSD and AI at the moment, for example, and it comes with very much different flavours and different variations, but I don't go into the details in this lecture.

What is important to emphasize here is that Friedman's original methodology has three steps, which you would take in an interactive manner. 1) There was desktop research, including interviews with experts to find out which values are at stake. 2) There were empirical investigations that are about the societal, commercial context in which a technology is being introduced to understand. Asking how certain values play out in this particular setting, and 3) there are technical investigations which on the one hand look into how specific technologies might promote certain values, and what you can learn for your own design from these kind of observations. In the last part of the lecture, I will focus mostly on the technical investigations, nevertheless keep in mind that a value sensitive design approach also asks for engagement with stakeholders and understanding the context.



Now, let's look at one of the central challenges in value sensitive design, translating values into design requirements. Value sensitive design is often used to minimize tension between values, so you would like to do X, but that would be on the cost of Y. So for example, you develop a technology, say a specific drone, but it's good to promote safety, but it will increase also power imbalances and threaten privacy. So basically you would like to have the cake and eat it, to do both, and that's basically the idea. So we would like to re-design X in such a way that it also promotes privacy or ownership. The guiding principle here is that if you, the moment where you consider something to be of moral value, you should not give up on it too easily. No moral value should be completely neglected. So it's worthwhile taking that additional effort in order to promote the other values as well.

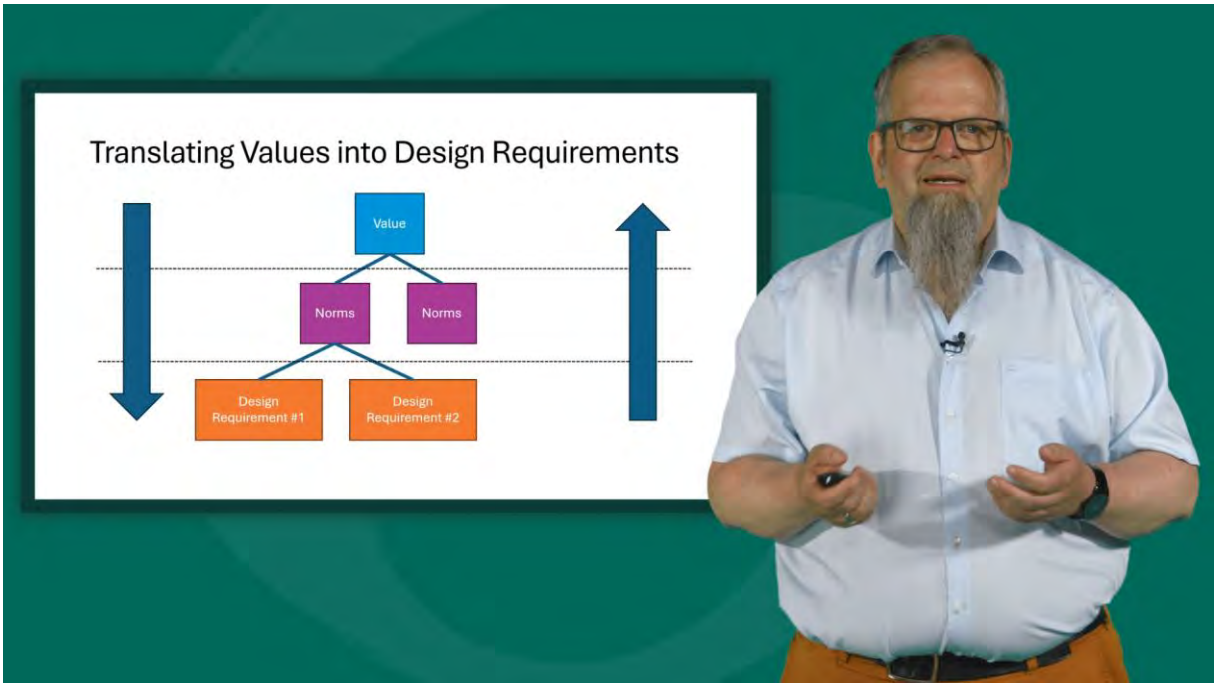


In order to do that, I found it very helpful to look into Ibo van der Poel's work, who introduced the idea of norms as a way to translate the values into design requirements. So basically it's a step in

between, where you first look into what values are at stake. Then you think about what kind of activities would help to realize this value, and then you move to the level of the artifact to say, okay, what kind of functionalities do I need in order to support the activities that I would like to see?

So for example, you may want to protect privacy, so what can you do? Well, I could, for example, minimize the data collection, say, okay, only take the data that we really need. You could offer control over the data to the users or the data subjects.

Once I reached that point, there could be even more norms, then you could say, okay, if we want to realize data minimization, then maybe we don't need these high resolution sensors we currently use. So let's go for low resolution imaging. And therefore, we can now end up with a design requirement that helps us to realize privacy in this very setting.



Now, the nice thing is that you can also do this in reverse. So I just gave you an example from going top down from the value to the norm, to the design requirement, but of course you can also analyse an existing artifact, looking at the functionalities being offered, move to the user activity that is being promoted, and then you realize what kind of values are at stake here. Isn't that nice?

Now, of course, there's also some limitations of value sensitive design, which you should be aware of.

Limitations of VSD

- VSD will not solve all moral problems but can be part of our moral learning.
- Users are creative.
- Doing VSD well requires a lot of resources.
- VSD helps designing a desirable technical solution, but it does not provide you with a framework to ask if there should be a technical solution.

First of all, value sensitive design will not solve all moral problems. It can only be part of our moral learning. So it's not a silver bullet, but it's a way to think consciously about the implications that technologies may have and how we can develop technology with norms and values in mind.

It might be helpful in order to avoid repeating the same mistake over and over again. Please keep in mind that users are creative. You might have to think of a lot of different use cases and then users still might do something else. So don't overestimate the power of VSD. It's a helpful tool, but there is also the current use of it.

Doing value sensitive design also requires a lot of resources. If you do the stakeholder outreach well, if you do all the analysis of the context well, that will take your time. The longest project I have been involved in took eight years in order to develop a technology.

And finally, value sensitive design is great if you already established that there needs to be a technical solution or that technology can be part of a solution or a particular problem. There's nothing in value sensitive design that helps you reaching that kind of conclusion – whether technology is needed in the first place. So it's a framework that is meant for the design process. It starts with design requirements, but it doesn't help you to evaluate the whole context in which you're operating.

Thank you very much. I hope it got you a good idea how to start with value sensitive design.

Mini-Exercise:

The below table lists some of the key principles of value sensitive design write down what the rational for those principles is (we completed one for you as an example) and cross-check your learning with the completed table in the annex.

Key Principle	Rational behind Principle
Technologies are value-laden.	They are value-laden because designers need to take value-laden decisions in the design process. Technologies are also value-laden because they allow us to realize certain values more easy than other.
VSD is proactive.	
We can translate (moral) values into norms, and norms into design requirements.	
VSD is not meant to analyse the overall need for a technological solution.	

QUIZ: KEY PRINCIPLE OF ETHICS BY DESIGN

Let's see how much you remember from the lecture in following exercise you will be asked to match the key principles from the Ethics by Design with their definitions and a statement that gives an example of how that principle is relevant for a drone data project. See if you can match the **Principle and Rational** with the correct statement about the **Relevance of the principle for a Drone Data Project.** Match each statement with one of four possible answers:

Relevance Statement 1: The type of drone and settings for flying it one chooses are not neutral they influence e.g. engagement with communities.

Relevance Statement 2: Ethical considerations should be included from the beginning of the research design.

Relevance Statement 3: Designing research or technologies needs to pay attention to what kind of behaviour the design should support.

Relevance Statement 4: Additional tools are needed to analyse whether we should use drone data for a given project.

Principle: VSD is not meant to analyse the overall need for a technological solution. **Explanation:** VSD takes design requirements as a starting point. It is not concerned with analysing the overall situation and if there should be a technical solution	
Principle: Technologies are value-laden. **Explanation:** Technologies are value-laden because designers need to take value-laden decisions in the design process. Technologies are also value-laden because they allow us to realize certain values more easy than other (e.g. through the design of different functionalities, like stealth mode).	
Principle: VSD is proactive. **Explanation:** Traditional Ethics reflect upon existing technologies. VSD frontloads Ethics and makes it part of the design process. Therefore, it not only asks what needs to be avoided, but also asks in what kind of society we want to live.	
Principle: We can translate (moral) values into norms, and norms into design requirements. **Definitions:** "Norms" specify the actions which we take to realize a certain value. "Design requirements" define how a technology can support users to adhere to the "Norms."	

APPLY ETHICS BY DESIGN

Value-Sensitive Design takes as a starting point that technologies are not neutral tools but shape how we perceive and act in the world. Furthermore, (moral) values are not abstract entities but are realized in human activities, which often involve technological artifacts. Simply put, some artifacts make it easier to do certain things and promote or undermine specific values.

The relationship between a specific (moral) value and a technology can be described as follows:

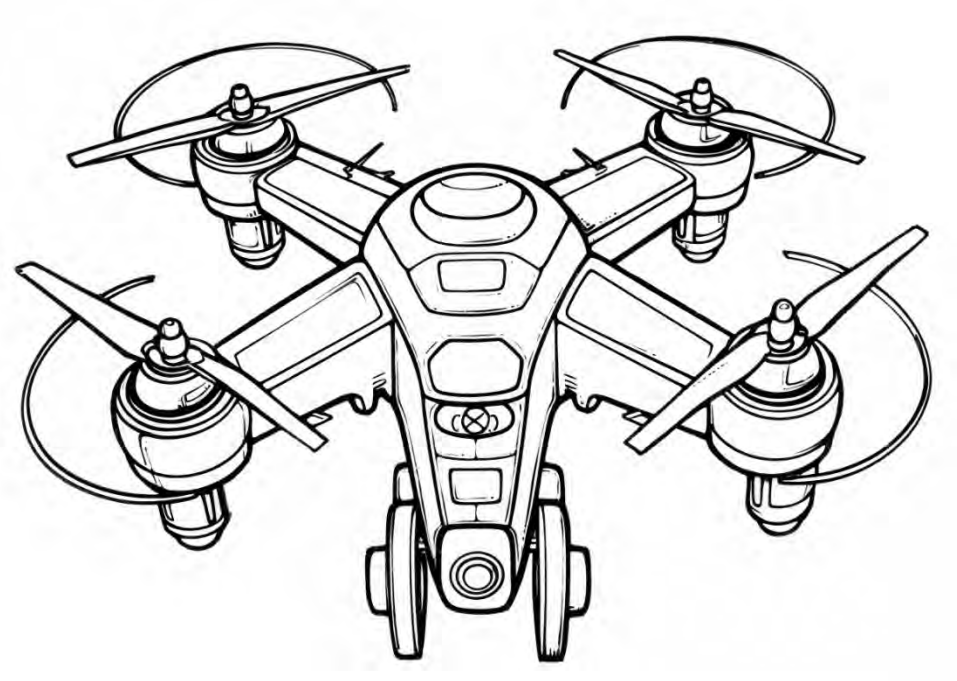
1. **(Moral) Value**
2. **Norm:** Activities that the user needs to undertake to realize a value; in other words, what do you expect someone to do who strives to be, e.g., just or mindful about other people's privacy?
3. **Design requirement(s):** Which feature(s) would support the users to act in accordance with the norm (as specified under 2).

For example, if I want to promote the values of transparency and accountability, I may want users to recognize a drone as such. Therefore, the drone should be clearly visible (e.g., using bright colours on the drone).

With these goals in mind, consider: what could a drone look like that promotes a value such as privacy, justice, or inclusion?

On this page you will find a simple drawing of a drone. Brainstorm what about the drone could be **different** or more **accentuated** to increase the chances of an **ethical drone data project.**

This is a creative exercise that may be best done together with a colleague or a friend. Print out the simple drawing and start changing it with ethics in mind, alternatively create a list of changes that you think might be useful. It can be easier to focus on one value to start with.



"Drone Coloring For Young Artists", CC-BY 4.0. Source: Link

In the Annex we will provide one example of how this exercise has previously been approached – before looking at that example. Be creative, make a choices about which values to focus on and how you might make value sensitive design decisions for drone data projects.

UNIT 4: DRONE ETHICS IN CONTEXT

After completing this unit you will be able to:

Differentiate how decolonial and intersectional lenses reframe ethics concerns in humanitarian work

and

Critique existing projects including projects labelled 'ethics proof'.

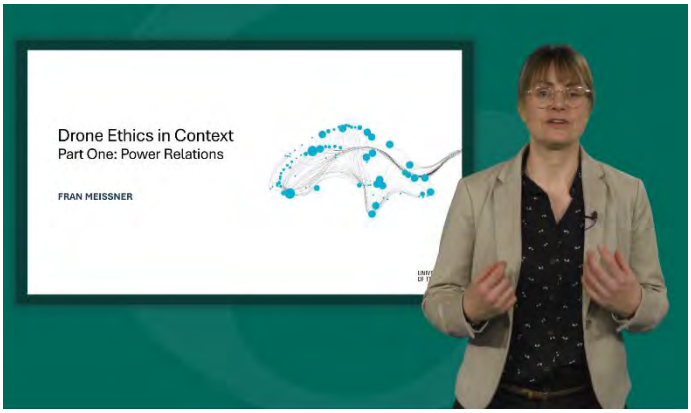
LECTURE: POWER RELATIONS

This unit is all about how context is relevant for recognising and mitigating ethics concerns throughout the drone data project lifecycle.

Read the below lecture with Dr. Fran Meissner for an introduction to the idea of power and essential questions to ask for any project. In this lecture Dr. Fran Meissner introduces the idea of power and why it is crucial to always ask: who will be advantaged by this project?

Transcript:

Lecturer: Dr Fran Meissner



Welcome everyone.

This unit is all about considering ethics and drone data projects in context. As we explained during the introductory unit of the course, context can have important implications for doing ethics in drone data projects.

This can be for various reasons including - but not limited to - different regulatory landscapes and how well they protect ethics. It can also be due the different historical cross-roads a project takes place in, as well as due to how local vernaculars of values guide priorities of what it means to facilitate 'the good life' and the flourishing of all. For example, the notion of Ubuntu and its focus on community over individual flourishing, is often highlighted when

considering whether European privacy regulations - that build on individual autonomy and individual data rights - are indeed suitable for contexts where Ubuntu is a guiding principle. Another question is about how to most effectively ensure that data projects more generally and drone data projects in particular don't work to further worsen the situation of those already most disadvantaged.

With the advent of digital technologies, including technologies made possible with and through drone data, recent years have seen scholars and practitioners ringing the alarm bells both over how technology is developed and about how ethics is instrumentalised in tech development.

Many so called 'data for good' or projects with similar slogans are used to justify fundamentally unethical practices. One often cited concern is that digital data projects either create new or re-enforce existing power differentials. Now what does that mean? Very basically it means that those already disadvantaged, as a result of digital data technologies, are even less able to influence the world around them – they are made even more powerless.

An illustrative example where drones play a key role is precision agriculture projects that are initiated by large multi-national companies. On the surface these projects ensure higher yields and thus help feed more people. If data produced and deep-learning methods employed in those projects are proprietary, and if getting access to them binds farmers to specific large corporations, it however also creates a dependency that may, and often is, exploited further down the line. This can mean that local farmers are stripped of the power to choose, for example, which suppliers they buy their seeds from.

Doing ethics demands that we also think about the broader and contextually specific implications of

digitally improving the world. In the precision agriculture example, we also should consider that the predominance of large scale farming makes the livelihoods of small hold farmers near impossible – creating fundamental changes in the already existing rift between poor and rich and how social relations and access to labour is structured – both locally and at larger scales. Large scale farming can also have detrimental effects on bio-diversity crucial for resilience in the food supply chain. All of these observations require us to ask how should drone data be used. Often drone data projects aim to deliver a solution to a very specific problem, in our example food shortage, and it is easy to lose sight of the broader picture and the social justice related questions those very solutions entail.

Large scale precision agriculture is only one example where already powerful actors use geotechnologies to solve a problem and at the same time consolidate their own market position rather than facilitating the independence of less powerful actors – something that most ethics approaches condemn.

Similar problems can also arise if the project is not for profit. One example might be projects that use earth observation imagery to trace the movement of refugees with the objective of providing predictive analytics about where support for those individuals is needed, next to the spurious nature of such efforts, such projects ultimately, as a by-product, also produce information that is used by governments or other malicious actors to make the lives of those already vulnerable populations even more difficult.


Regular Articles

Migration information infrastructures: power, control and responsibility at a new frontier of migration research

Fran Meissner & Linnet Taylor

Pages 2227-2246 | Published online: 21 Feb 2024

Cite this article

https://doi.org/10.1080/1369183X.2024.2307772

How can this drone data project most effectively ensure that the needs of those most socially and economically excluded are met?

A key practice in applied ethics is to ask how can this drone data project most effectively ensure that the needs of those most socially and economically excluded are met?

One approach to this is to commit to a community drone project approach. Instead of starting from a pre-defined such projects start with engaging with local communities to understand if and what their needs are and how drone data might be used to support those needs. This type of approach goes much beyond asking for


Community Drone Projects

Grounding drones in political ecology: understanding the complexities and power relations of drone use in conservation

Authors: Brodi Bersaglio, Chris Enns, Mara Goldman, Libby Lunstrum, and Naomi Millner

Article Category: Research Article
Copyright: © Authors 2023
Online Publication Date: 28 Jun 2023
Pages: 47-67
Publisher: Bristol University Press
Volume/Issue: Volume 2: 1

Open Access Review

The Global Emergence of Community Drones (2012–2017)

by Nicolás Vargas-Ramírez and Jaime Paneque-Gálvez

Centro de Investigaciones en Geografía Ambiental, Universidad Nacional Autónoma de México Pátzcuaro No. 8701, Morelia CP 58190, Michoacán, Mexico

Authors to whom correspondence should be addressed.

Drones 2019, 3(4), 76; https://doi.org/10.3390/drones3040076

Open Access Article

Grassroots Innovation Using Drones for Indigenous Mapping and Monitoring

by Jaime Paneque-Gálvez, Nicolás Vargas-Ramírez, Brian M. Napoletano and Anthony Cummings

Centro de Investigaciones en Geografía Ambiental, Universidad Nacional Autónoma de México, Antigua carretera a Pátzcuaro No. 8701, Morelia CP 58190, Michoacán, Mexico

School of Economic, Political and Policy Sciences, University of Texas at Dallas, 800 West Campbell Road, G

Conference Paper No. 80

Counter-mapping Land Grabs with Community Drones in Indonesia

Irendra Radjawali and Oliver Pye

June 2015

consent and builds on co-creating projects instead. It also entails setting up projects in ways where power to use and benefit from the data is transferred to those most effected by the use of the data. These kinds of projects might not meet the usual 'business case' logic. Community drone projects require engaging much more deeply with locally experienced issues and with the question of whether a drone data project is indeed the most effective and least harmful approach to addressing those issues.

QUIZ: POWER RELATIONS

Now things are getting a bit more complex, aren't they? Try the below quiz to check if you remember the key messages introduced by Fran Meissner in the lecture **Drone Ethics in Context - Power Relations.**

Chose the most appropriate answer:

1. Thinking about context in considering ethical aspects of a project is important because:
    a. All of the these options.
    b. Local ways of thinking about what is 'good' can differ.
    c. Different regulatory landscapes protect ethics to differing degrees.
    d. Historical context is important for understanding local inequalities.

2. When we talk about power relations as important to ethics what do we mean?
    a. Having power is important for charging and flying drones and it is crucial to doing good with a drone data project.
    b. Power refers to the ability to influence the world around us. More powerful people, if they abuse that power can harm those in less powerful positions.
    c. Power matters to maintaining the status quo, understanding power helps us understand how to keep things as they are.
3. What do we mean when we are talking about community drone projects?
    a. Community drone projects aim to allow the community to define the research problem for a Drone data project. They also aim to transfer as much ownership of the project to local people as possible.
    b. Community Drone Projects are designed by specialist researchers to help a community in need with advanced drone technologies. They aim to engage with communities at the start by asking for permission and once the project is concluded.

Once you completed the Quiz, check the annex to see if you are correct and to get additional feedback.

LECTURE: DECOLONIAL RESEARCH PRINCIPLES AND INTERSECTIONALITY

In this lecture **Dr Fran Meissner** introduces the basic ideals and principles behind choosing and following a decolonial approach to research and why this matters to thinking about ethics in drone data projects.

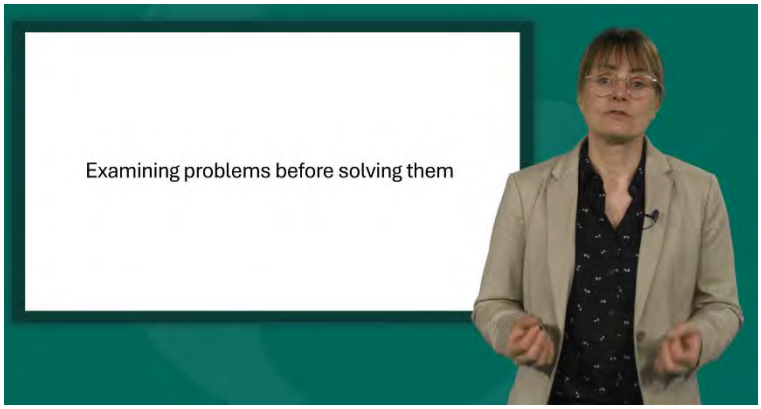
Transcript:

Lecturer: Dr Fran Meissner

Welcome back everybody. In the first part of this lecture we learned about why it is important to consider drone data projects in context.

In this part of the lecture we will engage with two perspectives that can be useful to consider in ethics assessments of drone data projects - decolonial perspectives and intersectional perspectives.

Both perspectives can spur on questions about ethics in context. They both are extremely rich ideas that we can only explore with you at a surface level. Doing so may already help you with looking beyond the usual engineering mindset, where a problems exists and the objective is to find a solution to that specific problem.



Decolonial and intersectional approaches both ask us to take a step back and understand why the problem exists in the first place and what new problems a solution creates.

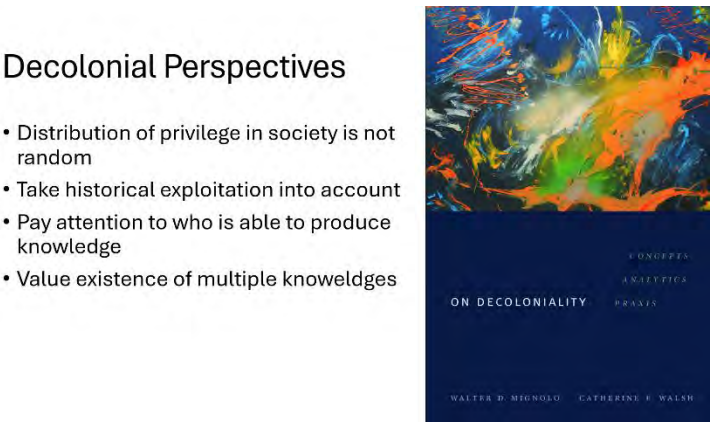
They help us harness that knowledge to address ethics concerns that go beyond the usual ethics check-boxes.

Decolonial perspectives are attentive to the fact that certain patterns of influence and privilege are not random but the result of historical practices of exploitation.

A core aspect of decolonial work is recognising that knowledge production – including the kind of knowledge we produce with drone data - is often structured by unequal power relations.

Those with the right skills and privilege get to produce data and decide on the rules of the game for how that data gets turned into knowledge and facts. Those without those privileges are often silenced in the process.

For example, we often consider expert knowledge to be more valuable and true – even though lived experience can make ordinary people the better experts in a particular context. To counter those imbalances some key values that decolonial research aspires to are reciprocity, reflexivity and attention to situatedness as well as a commitment to transformative change.



Reciprocity requires researchers to commit to asking how to ensure that those generating and using data do not disproportionately benefit from that process and its outcomes if compared to those who are a subject of the data.

The latter can include individuals but also communities depicted in drone imagery, it can also be about non-human actors that may be impacted by the research.

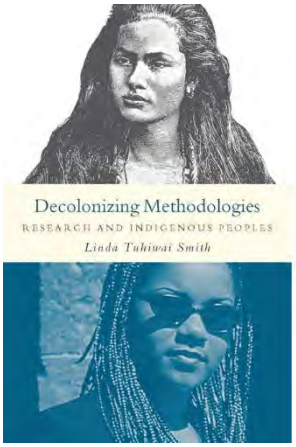
Reciprocity is not so much about quit for pro – fairly renumerating research subjects is important, but from an ethics perspective not enough. Reciprocity is often about considering how to avoid extractive research practices – in simple terms if the research extracts more than it can give back it is ethically problematic.

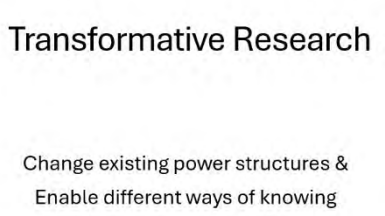
Reciprocity often has to be seen in the larger picture of a project, who and how is it funded, who benefits – including from the types of technologies are these locally produced, if not are they creating new and undesirable dependencies?

It also includes enabling the leadership of those often excluded from leading research processes – here reciprocity can start with simple acts such as recognizing that most research to be possible relies on many people's work – give credit where credit is due as they say.

Reflexivity and recognizing the situatedness of the research means that researchers reflect on how and when they are in a more powerful, full position within their research and how they can avoid exploiting those dynamics while recognizing that they are indeed dynamics that play out differently in different situations.

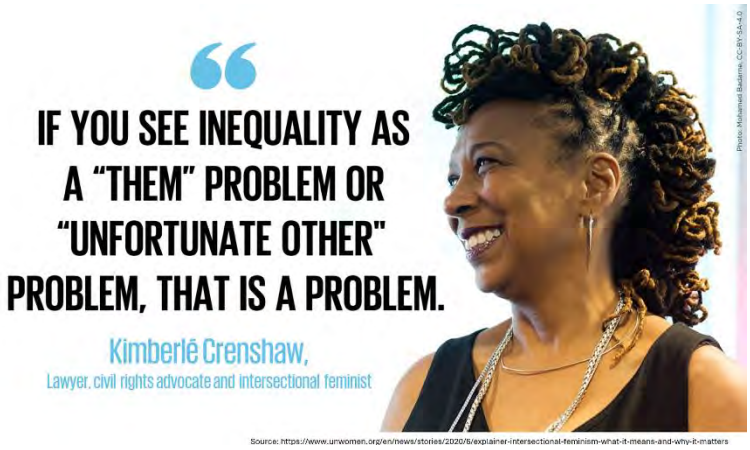
Authors such as Linda Tuhiwai Smith one of the early advocates for decolonizing research methodologies also emphasize that the ethics of a research project can be tied to whether its output is truly transformative and has the potential to change existing power structures or whether it simply builds on creating knowledge without aiming to truly recognize and enable different ways of knowing.





This may all seem abstract but asking about whose knowledge is valued within a project and which voices are silenced can reveal important ways of adjusting research in ways that has more transformative potential.

A related idea is that is important to pay attention to is intersectionality. This term - originated by the legal scholar Kimberly Crenshaw – essentially highlights that in studying disadvantage and aiming to address it – we quite often get stuck in mindsets that focus in on one specific population group - the poor, women, children - while in the process forgetting about important layering of different disadvantages. Being both a women and poor.



An intersectional lens then cautions us that often formal rules and regulation necessarily essentialize protected categories – while in specific contexts it will be important to pay attention to how those categories are on the ground diversified. These ideas are important for drone data projects because they caution us to set up and make sense of our research with complexity and relational ethics in mind and to actively avoid essentializing – be this in the way the project is set up or in the way that models and cartographic representations are used to make sense of the data.

Mini-Quiz

Which of the below definitions matches the term Decoloniality and which the term intersectionality?

Term	Definition
	The interaction of multiple forms of discrimination affecting the daily lived experience of individuals, leading to a compounding of disadvantage.
	Countering historically grown power structures through practices of reciprocity, reflexivity and a focus on transformative research.

READING: RESPONSIBLE DRONE USE FOR CONSERVATION

Many of the concepts discussed in this unit come together in the ethical use of drones for biodiversity conservation. Below you will find a guide prepared for drone data projects as a simple but handy guide explaining how to start overcoming some of the concerns that stem from the use of drones in biodiversity conservation. Much of the advice in the guide is also relevant for other types of drone data projects.

Millner, N., Laumonier, Y. Mulero-Pazmany, M., Paneque-Galvez, J., Sandbrook, C. 2023. *Responsible drone use in biodiversity conservation Guidelines for environmental and conservation organisations who use drones*. Cabot Institute for the Environment. Bristol University. https://www.cifor-icraf.org/publications/pdf_files/Flyer/8851-Flyer.pdf

We do not provide reading notes for this short guide as we simply want to point you to some insights and practical tips for doing community drone projects with ethics in mind.

DRONE ETHICS CASE STUDY

Put your analysis skills into action with this case study. Dr Rogers Alunge NNangsope has prepared for you a **fictive story** about a drone data project that raises different **ethics concerns**. The case study is fictive but it builds on Dr Alunge's research in Malawi working with regulators and humanitarian actors.

Read the case study carefully and **note down** any ethics concerns that you feel the project raises. After you are done with carefully reading the case study, use the buttons below the case study and **answer the questions** to test your ethics analysis skills as well as learn about important differences in types of data and differentiating between regulatory concerns and ethics concerns.

Drone Ethics Case Study: **Data Responsibility & Ethics**

SKYNET is a Russian-based private company specialising in drone manufacturing and aerial image processing. They pride themselves on always being at the forefront of innovations in technology for small aircrafts. They have also recently launched projects to incorporate Artificial Intelligence into their technology, including training their algorithms in facial recognition.

Following the 2022 Cyclone Freddy disaster in Southern Malawi, which especially affected the Nsanje district, several organisations have been moving into the region to help with crisis relief and impact assessment. Nsanje is also known to be a relatively low-income but highly traditional community, with many outdoor, roofless bathrooms. The people are also generally spiritual, with several shrines in some elevated areas. Several traditional ceremonies are also celebrated throughout the year.

SKYNET wishes to participate in the ongoing relief and impact assessment efforts in Nsanje by deploying 20 drones equipped with powerful cameras and sensors to collect aerial, high-resolution data on the ground. Their representatives in Malawi approach the Nsanje community leaders to inform them about their intentions. However, the Nsanje community leaders are reluctant to let SKYNET fly their drones; they feel frustrated because several organisations have been coming to fly drones in their community before, but they need concrete help brought to the people. However, SKYNET already has the approval to fly their drones from the Malawi government, which desperately needs as much help as possible in its relief efforts in Nsanje. SKYNET is equally aware of Article 18(2)(g) of the 2019 Malawi Data Protection Bill, according to which an organisation can process individuals' personal data for a humanitarian initiative, in which case there will be no requirement for the individuals to give their prior consent. While SKYNET is primarily interested in testing their new technology and obtaining data to train their AI applications, they can claim to support humanitarian efforts; after all, they know that drones have been flown in the area without local communities having seen significant improvements in their hardship.

Interesting story, right? On the next pages we have prepared some questions for you that an ethics advisor may need to consider in analysing this case. Give it a try and see what you have already learned.

Mini-Quiz Drone Ethics Case Study

You are an independent Data Responsibility & Ethics Officer and preparing a report advising SKYNET, on the following points:

1. **What kind of data would SKYNET drones most likely collect if they were used as indicated in the Case Study?**

    a. Personal data
    b. Non-personal Data
    c. Group data
    d. Sensitive data
    e. All of the above.

Before choosing an answer let's review what is meant by these different types of data. Once you read the table consider: what types are you most likely going to encounter in your own work with drones?

Type of Data	Definition
Personal	Personal data are data relating to an identified or identifiable natural person. This means that information is either directly about someone or can be traced back to this person. The camera's high resolution and facial recognition software means that the Skynet Drone Suite processes biometric data, which can be used to identify a specific individual and which is thus personal. Many countries worldwide have strict rules about the conditions under which personal data may be processed.
Non-personal data	Non-personal data is digital data that cannot be traced back to, or used to identify specific individuals. In our example this can be any data points that cannot directly be linked to an individual. It can also be data that has been fully anonymised (where data about an individual by itself is not sufficient to identify an individual). While personal data is often subject to regulations – non-personal data are rarely subject to regulatory interventions.
Group Data	Group data and the related concept of group privacy highlight that some characteristics may be specific to groups of people. This type of data will not allow recognising a natural person. Group data is the result of inferences that can be made about a group of people defined by a feature, or combination thereof, shared by all individuals in the group. In our case, one example of group data might be people wearing a particular type of clothing that is associated with being worn by a specific religious community. While such data would not allow identifying an individual it would make it possible to identify those individuals as part of a specific group. Especially in contexts where specific groups are subject to negative treatment, revealing group data can be as problematic as personal data. However, data protection regulation often does not account for possible ‘ inference attacks’, making it all the more important to consider group data and group privacy and analysing the ethics of a drone data project.

Sensitive data	Sensitive data refers to data that requires a higher level of protection to avoid unauthorised access. Depending on the type of personal data, personal data can be sensitive– often referred to as sensitive personal data. Typical categories of sensitive data include data that reveal racial and ethnic origin, trade-union or other activists affiliation, political opinions, religious or philosophical beliefs, genetic and health related data and data concerning sexual orientation. Researchers should take extra care to safeguard such data through additional data security measures. What additional data is considered sensitive can differ from one context to another, and it can make sense to check with local communities about what information contained in drone imagery they do not feel comfortable being publicly known. In the Skynet case study, the drone imagery recording the locations of different places of worship makes those images sensitive data. This means that additional measures should be taken to safeguard that data (e.g. geomasking to hide the location of places that a local community considers sensitive). While there is often regulation in place to ensure the protection of sensitive data, not all categories of potentially sensitive data are covered by such regulations, calling for additional vigilance by the researcher collecting and processing drone image data.

Now that you have been able to give advice about the types of data and ethics considerations linked to them, lets address another question. Choose the most appropriate answer

2. Considering the government's approval and provisions of Article 18(2)(g) of the 2021 Malawi Data Protection Bill allowing the use of Drones for humanitarian purposes, would you advise that SKYNET flies its drones over Nsanje and thus disregards the reluctance of the Nsanje community leaders?

    a. Considering the government's approval and provisions of Article 18(2)(g) of the 2021 Malawi Data Protection Bill allowing the use of Drones for humanitarian purposes, would you advise that SKYNET flies its drones over Nsanje and thus disregards the reluctance of the Nsanje community leaders?

    b. It is commendable that SKYNET chose to consult the local community. They should take the reluctance of the local community leaders seriously and consider, ideally together with local actors, why the project proposed is not useful for advancing the needs of the local stakeholders. Ignoring the reluctance to participate in the project would be ethically problematic – even if there is a small chance that the SKYNET intervention might help with coordinating disaster relief operations.

3. In your ethics report, will you recommend that SKYNET should use the data for all their activities?

    a. Yes, so long as they observe local data protection regulations and don't break the law.

    b. No, there should be limits to how they use the data.

When you completed the mini quiz check your answers in the and additional feedback in the annex.

UNIT 5: HUMANITARIAN DRONES AND SECOND USE SCENARIOS

After completing this unit you will be able to:

Outline possible unintended consequences of the use of a particular data technology.

COMMON HUMANITARIAN DRONE USES AND MILITARY APPLICATIONS

Learn about the ethics of Dual-Use and practice identifying potential military use cases of humanitarian drone projects.

Working with Drones always means that we have to be aware of and vigilant about the fact that many drone data projects produce methods and knowledge that can be used both to do good but that may also be used in less amicable ways. This is why Drone Data Projects almost inevitably have to engage with the ethics of **Dual-Use.** Doing so requires asking how else can the technical capabilities developed as part of the project or the outputs produced be used and could those uses lead to unintended harm.

It is not always possible to predict other uses but sometimes it can be important to be clear in your project documentation about intended uses and in giving access to your project consider who should have access to your data and technological developments.

To illustrate that point the exercise below presents a humanitarian use case then asks you to consider a possible military use case. Earlier in the course you have looked at the report: Drones for Humanitarian Action and the two humanitarian examples derive from that report.

Consider what military applications come to mind for the two examples described below. Once you wrote down notes compare them with the second use cases we identify in the annex.

Case A: Infrastructure Risk Assessment
Use case Description: High-resolution aerial imagery, including orthomosaics or 3D models, complements the assessment of the condition and damage to various infrastructures, such as roads, bridges, schools, health facilities, and other structures. Drones provide detailed visual data, enabling infrastructure managers and engineers to evaluate the state of assets efficiently. By conducting aerial inspections, maintenance and repair teams can identify issues, plan interventions, and prioritize resources effectively, ultimately improving the safety and longevity of critical infrastructure.

Case B: Search and rescue of missing people
Use case Description:
Drones are invaluable for conducting aerial searches over expansive areas, providing a broad overview of the terrain and access to ground-level details. Equipped with thermal cameras, drones can detect heat signatures and identify signs of human presence, such as individuals, vehicles, or structures. During search and rescue missions, drones significantly enhance the efficiency of operations, covering large territories more quickly than ground-based teams. The visual data captured by drones aids rescue teams in identifying potential locations of missing persons, enabling timely and targeted search efforts.

LECTURE: THINKING ETHICALLY ABOUT OPEN DATA

Unintended second use case scenarios like unwanted military applications of drone data technologies are but one concern. The way we store and deal with data can also teach us important lessons about ethics considerations needed to avoid unintended consequences. Making data open and accessible is usually thought to be good research practice as it lowers barriers to doing research and allows for reducing redundant data collection campaigns. As you will learn in this lecture given by Michael Nagenborg, ethical deliberation will show that sometimes it is important to ensure that data is as open as possible but also as closed as necessary.

Transcript:

Lecturer: Dr Michael Nagenborg

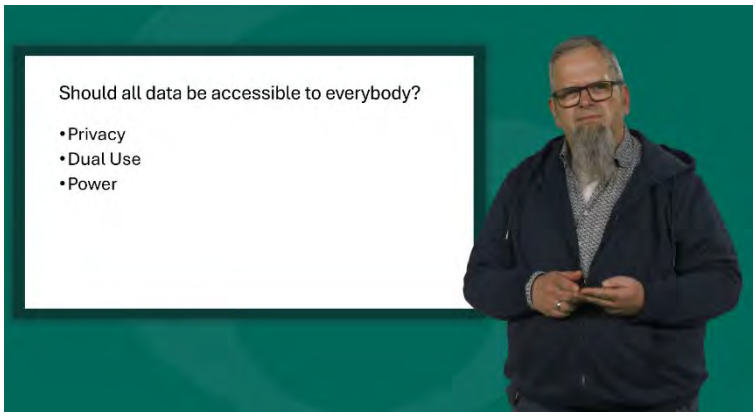
Welcome to my mini-lecture on thinking ethically about open data.

There are many good reasons to make and keep datasets open, and therefore it seems reasonable to share your data with other researchers, practitioners, and the public at large.

Making datasets available to the public opens up opportunities to validate your own research. In addition, others may benefit from and reuse the data. Thus, we may save data costs and be able to include locations and communities that would remain invisible otherwise. Finally, one can also think about open data as a way to give something in return to the communities which are represented in the data. Along similar lines, it has been argued that research outcomes, if funded by public money, should also be made available to the public.

So, should all data be accessible to everybody? There are at least three more points to consider, privacy, dual use, and power imbalances.

Let me start with privacy. Actually, the struggle of historians to do justice to the privacy of dead people when researching, for example, diaries and letters, was quite an essential issue in the discussion about the tension between the freedom to do research and the right to privacy. Since the documents in question are often considered to be in the public domain, or at least that our owned public institutions such as archives, this discussion is closer to discussions of ethics and open data than it might at first seem.



In our context, remote sensing data is often produced without people's explicit informed consent. Therefore, it is quite common to exclude personally identifiable information from public datasets. Which might be more shallow than it seems, since the available data still reveals something about the everyday context of people living and working in that specific region. To stick with the example in the discussion about post-mortem privacy, one can ask how to decide how many years precisely do we have to wait until we research the data? Here, however, we must distinguish between the pragmatic need to create guidelines, for example, for legal purposes, and the ethical reasoning for being mindful of privacy.

The answer to the question which data can be made public might, for example, also depend on the local context. Therefore, from an ethical perspective, we should always involve communities depicted in the data to better understand the meaning of the specific sites and locations included in the data.

Second, dual use. We addressed the challenge of civil and military dual use in the previous exercise. It is also important to consider open data here, because if data is available to the public, it is also available to military forces. A well-known and set example led to the formulation of the Signal Code of Ethics. Harvard's Signal Program did a project on mass atrocity remote sensing in which satellite and other spatial data were used to document crimes against humanity. Sadly, the groups committing these crimes got access to the data and used them in their decision making and more targeted attacks. Now, the data in this case wasn't made public or payable, still the case serves as a good reminder that making data public, might very well be used for military purposes.

Finally, we need to consider power differences. Open data initiatives are often motivated by making data available to everybody. However, only some data sets and maps can be used by everybody. Instead, it might also require a lot of expertise and access to computational power in order to make sense of that data. Thus, we have to consider how and why we make the data public. If the intention is to give something back to the communities mapped and researched, there might be better strategies than putting data in an open public data repository.

To conclude, there are many good reasons for making data available. However, making data accessible also means losing control over who uses the data for various purposes. Thus, before publishing data, we may have to consider questions regarding privacy, dual use and equality to avoid undesirable consequences.

Mini-Quiz on next page.

Mini-Quiz

Let's see how well you remember the main takeaways from the lecture. Try to sort the words to match with reasons for making data open and reasons for not making it accessible to third parties.

Words: Power; Transparency; Cost Saving; Dual Use; Privacy; Research Validation

Reasons to keep data open access	Reasons to keep data with closed access

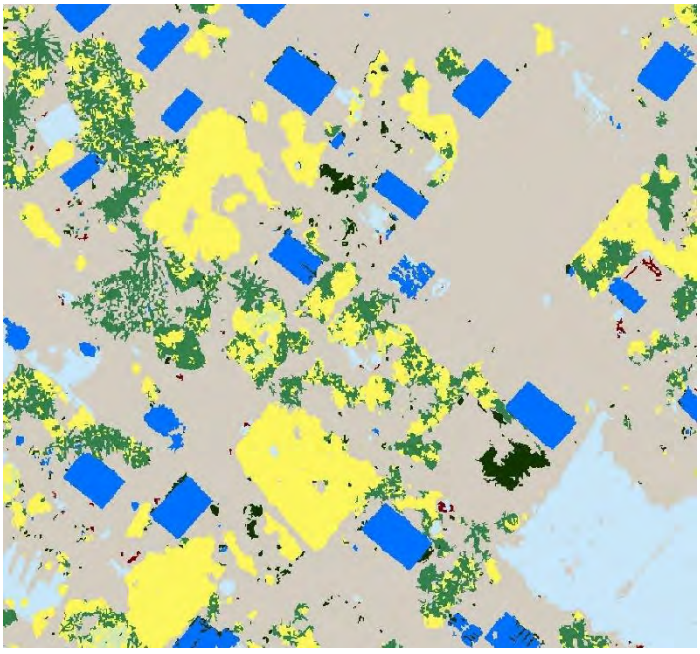
Check if your answers are correct in the annex.

COMPARE ML AND PEOPLE CLASSIFICATION

Presented to you (picture 1) is a UAV image of a neighbourhood. This UAV imagery is an example of an image that humanitarians use in early warning - early action systems, among other geodata types. One of the tasks that UAV imagery could be used for is for the detection and classification of buildings in a given area. AI is increasingly used for this task.

Complete the exercises on the next page to reflect on ethics concerns that may be linked to this.

Picture 1 Arial Image



Picture 2 - AI Classification

Task 1: Identify and number the buildings in the UAV image (picture 1).

The buildings in the area can be categorized by the roofing material (iron-sheet roof vs thatched roofs). Try circling each type with a different pen colour or with a photo editor on a phone.

Task 2: **Compare your results to those of an AI algorithm presented to you (picture 2). Do you note any differences between your classification results and the one by AI?**

What did you find? Check the Annex for some feedback.

Task 3: **What kind of adverse effects of AI can you anticipate?**

How could the use of AI in humanitarian interventions adversely affect the neighbourhood when it comes to humanitarian decision making based on the results?

a) Humanitarian housing surveys are often used to decide about where humanitarian action should take place, the neighbourhood may not receive the right aid.
b) Another drone will need to fly even lower over the village to get more detailed data for the machine learning to classify.

Check the annex to find out which is the right answer and to get further feedback.

LECTURE: DRONE IMAGE ANALYSIS & AI ETHICS

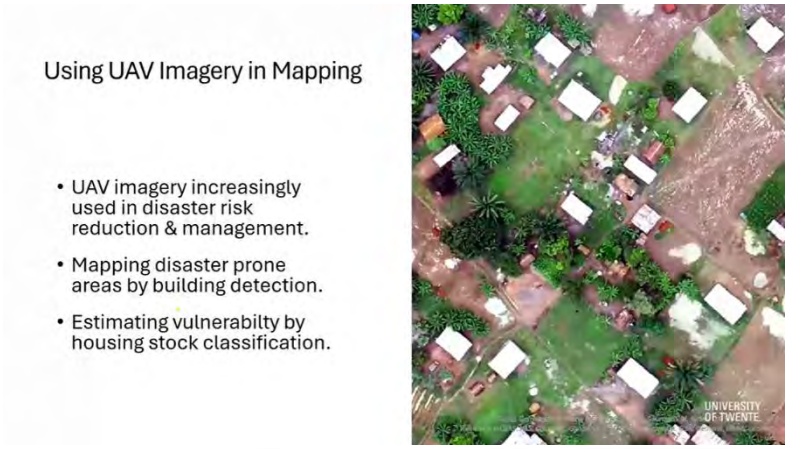
Read this lecture by Brian Masinde explaining how ethics concerns and unintended consequences can crop up when using machine learning for drone image analysis.

Transcript:

Lecturer: Brian Masinde

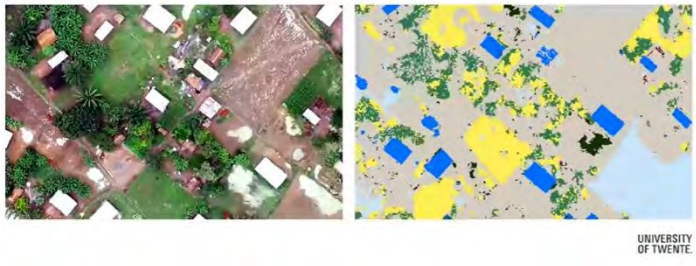
Hello, my name is Brian Masinde. I do research on responsible use of AI and geodata technologies.

In the next few minutes, I'm going to talk about bias in algorithmic mapping. First of all, to set the context, UAV imagery are increasingly being used in disaster risk reduction and management. For example, in mapping disaster-prone areas by building detection. A good example is estimating vulnerability by housing stock classification. This is determining the amount of damage one would expect in case of a hazard on different types of buildings in an area.

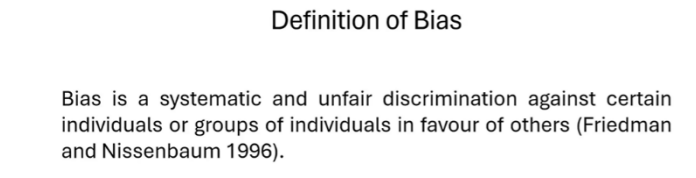


The UAV image on the right is an example of a settlement area that has got different building materials as roofing types.

In this slide [on the right], we show an example of a classification output from an AI algorithm. This algorithm was used to detect the different building materials used in the area.



But first, how will we define a bias in this context? A bias is a systematic and unfair discrimination against certain individuals or group of individuals in favour of others.

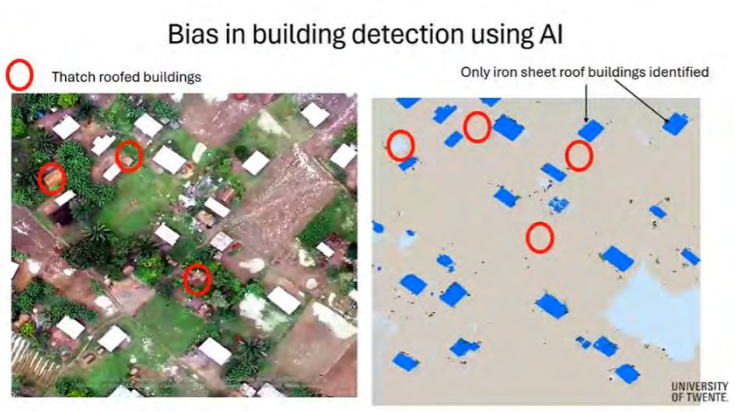


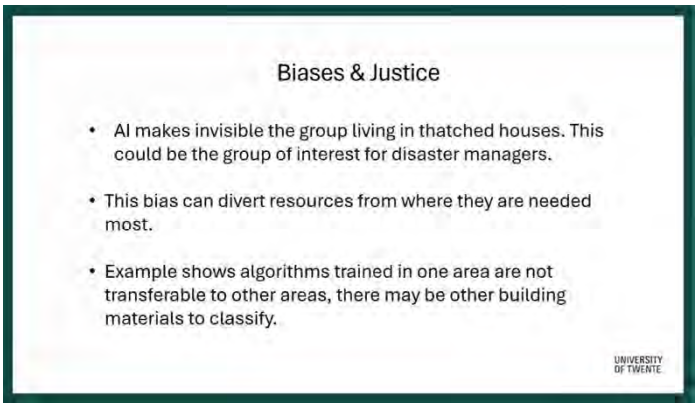
In this classification algorithm, therefore, the bias occurs when the algorithm does a good job of identifying iron sheet roof

buildings but does a poor job of identifying thatched roof buildings. So the bias here is that the AI makes the group living in thatched houses invisible. This could be the group of interest for disaster managers.

Furthermore, this bias can divert resources from where they are needed the most. This example also shows algorithms trained in one area are not transferable to other areas since there may be other building materials to classify or to identify.

Bias is also a justice concern because justice is about the fair distribution of resources. A lack of justice can reconfigure relationships between groups of people. This occurs when there are tensions about unfair distribution of resources. So disaster managers have to justify where a particular group of people receive more aid or do not receive aid at all compared to others. Thank you.





Mini-Quiz

Match the terms Justice and Bias to the definitions in the table below. Check your answers in the annex.

Term	**Definition**
	Fair distribution of resources.
	Systematic and unfair discrimination against certain individuals or groups.

UNIT 6: BRINGING IT ALL TOGETHER

After completing this unit you will be able to bring everything you learned together to:

Plan project processes with ethics evaluations throughout the project life cycle.

LECTURE: COURSE SUMMARY

Watch [Read] this final lecture for a summary of key points and preparation to think beyond checkboxes.

You have almost reached the end of this course. This final lecture by Dr Fran Meissner will summarize key points for you and make sure you are ready to think beyond checkboxes when doing ethics evaluations of drone data projects.

Transcript:

Lecturer: Dr Fran Meissner

Dear learners, welcome back, this is the last lecture of our course: Ethics for Drone Data Projects. It has been a pleasure learning with you. We hope you have enjoyed the course.

This final lecture will summarise the course content repeating and making links between what you already learned.

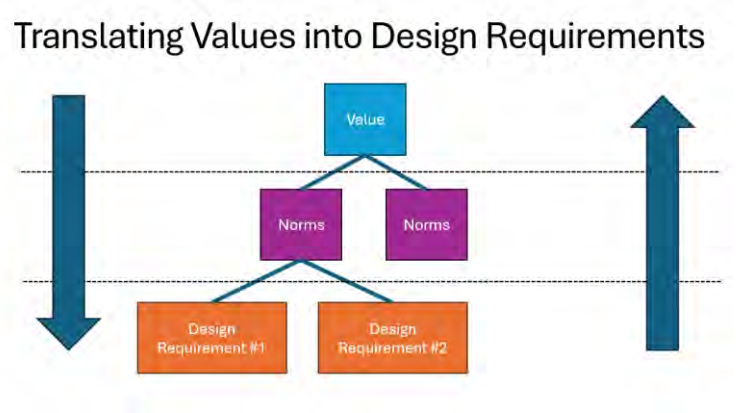
The objective is to remind you about how you can use the learned material to plan project processes keeping ethics evaluations throughout the project life cycle in mind. Once you know how to do this – you may need to practice for a bit - you will have achieved the final learning objective of this course.

Let me take you back to the start of the course. Right at the start of the course, we had you think about the drone data lifecycle and emphasized that ethics concerns matter through the life cycle of a drone data project.

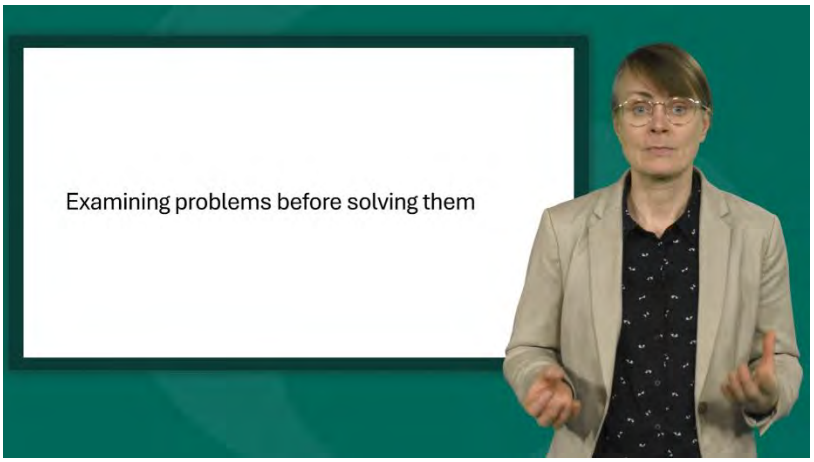
This is partly because drone data projects are often complex and can raise ethics concerns related to flying the drone – do you have consent from local populations to fly and collect data about aspects that might be sensitive to them?

But drone projects don't end with flying the drone; data is subsequently processed, raising concerns over data handling and how analytical choices might result in harmful outcomes.

Even after processing, projects are usually used to make recommendations based on the insights, and it can then be important to think about the most ethical ways of communicating results and how to communicate inevitable uncertainties in the analysis. And this is just a quick show of hands about possible concerns. We are confident you can list many additional ethics concerns that can emerge throughout the drone data life cycle. You will also be much more apt at recognizing the multitude of stakeholders, affected populations, and environmental concerns that drone data projects raise. Once you can look at a drone data project and recognize known and emergent concerns, your ethical practice can start working towards mitigating and engaging with those concerns.



In the remaining Units, we tried to give you tools for doing so; for one, we highlighted the option of paying attention to which values are driving the project design and implementation and making choosing those a proactive part of your project. You also learned that doing so does make a project resource-intensive. Still, we also hope that you learned that, in general, taking ethics seriously will take time and commitment. Still, it also offers the opportunity to reflect on and improve the projects you are involved in. While value-sensitive design principles tend to point to the design process, designing and implementing projects will always happen in context, and paying attention to those contexts is crucial.



While there may be pressure to develop solutions that fit with varied contexts – ethics tend to point us towards paying close attention to who is affected and how – and this will differ depending on where a certain drone project takes place.

Paying attention to the context we learned also allows us to reflect on more structural problems and how to address those. We introduced you to community drones and suggested that considering how power relations shape projects can be an important aspect of ethical deliberations.

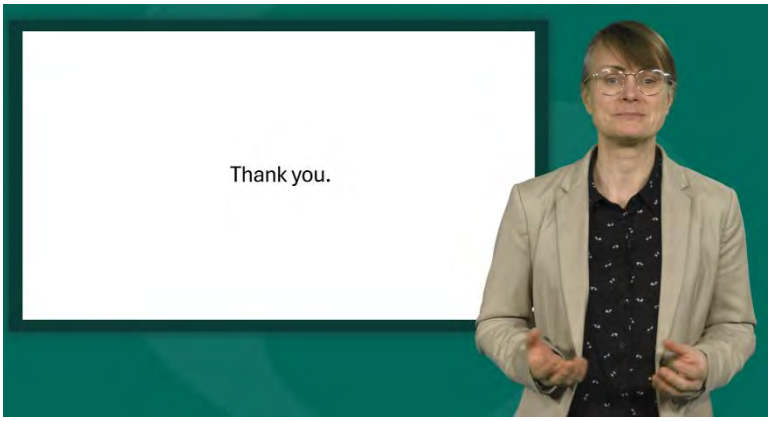
Is this project only maintaining the status quo, or could we change how we work to emphasize transformations that bring about broad welfare, even for those in more marginalized positions? Often, this can be achieved by paying attention to 'expert' knowledge and investing the time to learn and engage with different ways of knowing a situation.

While that part of the course might have been somewhat abstract, it points to the social and environmental complexities that often underly drone data projects and how they affect the project lifecycle. What we hope you took away was that adopting decolonial or intersectional lenses in doing data work can change how you do that work and how you make sense of doing ethical research. Doing so also gives you the tools to recognize that not all projects proclaiming to be very ethical in practice are that ethical.

How can this drone data project most effectively ensure that the needs of those most socially and economically excluded are met?

The final part of your learning revolved all around paying attention to engaging with and recognizing the importance of unintended consequences in Drone data projects – you learned that important research principles like fostering open data at times may require ethical deliberations to avoid unintended harms, but also that it is important to recognize how different ways of automating workflows and analysis will also have very specific implications that will not in terms of project outcomes potentially have problematic dimensions. Attention to such circumstances helps us take ethics seriously throughout the drone data life cycle. Something that the exercises throughout this course hopefully helped you to adopt as part of your professional practice.

Ethics as a continuous practice



Ethics is an evolving field, and there will never be an exhaustive list of ethics concerns to check a project against; it always makes sense to avoid known concerns, but it also always makes sense to analyze and recognize whether a project may harbor ethical concerns that are less frequently discussed. On this note, I wish you continued successful learning and that you will find returning the lectures, exercises and suggested reading from this course useful. Thank you for joining us for this course.

FINAL REFLECTION ACTIVITY

Congratulations, you have reached the end of the course! Take a moment to note down five key things that you learned during the course. Once you noted them down return one last time to the Annex for some final feedback.

#	Key Takeaway
KT 1	
KT 2	
KT 3	
KT 4	
KT 5	

Feel free to add additional ones.

ANNEX

In this annex you will find correct answers to quiz questions and feedback that will help you improve your learning. First complete the exercises and quizzes to the best of your knowledge in the main part of this document. When you completed an exercise find the matching title here in the annex and compare if you responded correctly.

QUIZ: ETHICS CONCEPTS

Multiple Choice, choose the most appropriate answer and then check your answers with those in the annex.

1. What is Ethics?

Answer Options	Feedback
a. Ethics, as a discipline, focuses on evaluating human actions.	Well done, that is correct. Social norms and the law are important for making sense of ethics but in themselves are not sufficient to guarantee ethical conduct. Indeed we have many historical and contemporary cases where the law and social norms allow for unethical behaviour.
b. Ethics is about following the law.	Ethics and the law are not the same. Indeed we have many examples of laws that are today seen as encouraging unethical behaviour, like the laws drawn up to bolster the slave trade. In addition, drawing up new laws takes time. When technologies are developing quickly often no adequate regulation is in place to guide ethical behaviour.
c. Ethics is about what is socially desirable.	Sorry that is wrong. Social norms can be important for making sense of ethics but especially if they sideline vulnerable populations following social norms can lead to unethical behaviour.
d. Ethics is about making drone projects look better to outside investors	That is incorrect, while a thorough ethics evaluation may be required by funders – just doing the bare minimum to please funders or worse making it look like a project has been assessed for ethics, when it has not is called ethics washing. Such practices often lead to unethical projects and outcomes.

2. What are Values?

Answer Options	Feedback
a. Values are easily defined principles that naturally guide our actions.	Almost right, only values can be tricky to define and as humans we can find it difficult at times to live up to our values.
b. Ideals that motivate our actions and guide our actions in a positive manner.	Well done! Indeed we think of values as ideals that motivate our actions in a positive manner. We tend to refer to ideals that influence our actions in a negative manner as vices (e.g. greed).
c. Values indicate how much a decision is worth.	Sorry, values are not the same as economic value.

3. What does doing contextually sensitive ethics entail?

Answer Options	Feedback
a. Accepting the value structure of a particular place.	Sorry that is wrong. Doing ethics may require sensitivity to local value structures but it is not about excusing unethical conduct by pointing to context.
b. Analysing the how specific projects have underlying principles and how these shape the project.	Well done. Indeed, if we take underlying principles for granted and do not aim to understand how they shape a project within the context where it is implemented, we will miss ethics concerns that may only be relevant in a specific context but less relevant in another one.
c. Assuming that values are always relative and only applicable in a particular context.	Context sensitive ethics does not assume this – ethics requires careful analysis.

READING: ETHICS IN TECH PRACTICE

We here list some key points from the technology ethics reading. We want to make sure that you are aware of aspects that will be relevant for the remainer of the course. Did you highlight the same points in your notes?

Reading Notes:

- Ethics is both about fostering ethical behaviour and making sense of and mitigating structural barriers to human flourishing
- There are many different ways to engage in ethics that range from theoretical engagement with what is right to practical applications of fostering better outcomes in specific (technologically augmented) settings.
- Digital and data technologies are increasingly shaping how we experience the world around us, this prevalence makes paying specific attention to technology development and use an important focus for ethics. Not least because technology is often commercially developed and commercial interests can obscure ethical conduct.
- There is a long list of concerns that are specific to technology ethics, and as more technology gets developed new concerns emerge and become evident.
- Being able to identify ethical issues is a key skill in advancing ethics (for drone data projects).
- Practicing ethics needs practice through engaging with ethics frameworks, case studies and learning ethics routines.
- There is no such a thing as an ethics checklist – each project is unique and will pose specific ethics questions that have to be evaluated taking context into account.

READING: DRONES IN HUMANITARIAN CONTEXTS AND ROBOT ETHICS

Quiz:

1. In the context of humanitarian interventions, what is a significant concern for ensuring ethical projects?
    a. The high cost of deploying Drones in disaster zones.
    b. The technical challenges with operating drones in remote areas.
    c. The risk of reducing human-to-human interaction, which may lead to a loss of contextual understanding and empathy (Well done, this was the correct answer)

Reading Notes:

How did you like that reading? Learn anything new? Below you find a few key points from van Wynsberghe and Comes article that we want you to keep in mind as you progress through the course.

Reading notes:

- Article still relevant but much more research is now available on ethics in relation to the use of drones for humanitarian interventions.
- Introducing new technologies in the humanitarian domain requires rethinking long standing idea about how to live up to humanitarian ethics.
- Assessing human robot interactions can help recognise both the advantages of using a drone for a specific project and the kinds of problems that introduction entails.
- Often drone projects entail a technical approach to providing care that replaces direct human to human interactions.
- They use a hypothetical case study to identify possible risks (drone use in assessing migrant detention centres).
- Key risk for humanitarian workers:
- deskilling through less frequent contact with those needing aid – instead of deep understanding of the context and diverse needs, observation has to be formalised to be readable via the data that the drone can provide.
- Key risks for those served by the drone rather than the humanitarian worker:
- Higher risk of violating the dignity of individuals as drones are not empathetic
- Often those subject to research with drones are not able to understand what kind of data is collected about them and how it is used, which raises concerns over transparency.

1. Interacting with drones can cause high stress levels and discomfort that is not justified.

- Concerns over more vulnerable contexts being misused as testing grounds for technology (while being implemented in non-humanitarian settings only when they are known to work)

MINI-EXERCISE: LECTURE INTRODUCTION TO ETHICS BY DESIGN

Here is the full table to complement your learning from the lecture.

Key Principle	Rational behind Principle
Technologies are value-laden.	They are value-laden because designers need to take value-laden decisions in the design process. Technologies are also value-laden because they allow us to realize certain values more easy than other.
VSD is proactive.	Traditional Ethics reflect upon existing technologies. VSD frontloads Ethics and makes it part of the design process. Therefore, it not only asks what needs to be avoided, but also asks in what kind of society we want to live.
We can translate (moral) values into norms, and norms into design requirements.	"Norms" specify the actions which we take to realize a certain value. "Design requirements" define how a technology can support users to adhere to the "Norms."
VSD is not meant to analyse the overall need for a technological solution.	VSD takes design requirements as a starting point. It is not concerned with analysing the overall situation and if there should be a technical solution.

QUIZ: KEY PRINCIPLE OF ETHICS BY DESIGN

Check if you combined the answers correctly.

Principle: VSD is not meant to analyse the overall need for a technological solution. **Explanation:** VSD takes design requirements as a starting point. It is not concerned with analysing the overall situation and if there should be a technical solution	Additional tools are needed to analyse whether we should use drone data for a given project.
Principle: Technologies are value-laden. **Explanation:** Technologies are value-laden because designers need to take value-laden decisions in the design process. Technologies are also value-laden because they allow us to realize certain values more easy than other (e.g. through the design of different functionalities, like stealth mode).	The type of drone and settings for flying it one chooses are not neutral they influence e.g. engagement with communities.
Principle: VSD is proactive. **Explanation:** Traditional Ethics reflect upon existing technologies. VSD frontloads Ethics and makes it part of the design process. Therefore, it not only asks what needs to be avoided, but also asks in what kind of society we want to live.	Ethical considerations should be included from the beginning of the research design.
Principle: We can translate (moral) values into norms, and norms into design requirements. **Definitions:** "Norms" specify the actions which we take to realize a certain value. "Design requirements" define how a technology can support users to adhere to the "Norms."	Designing research or technologies needs to pay attention to what kind of behaviour the design should support.

APPLY ETHICS BY DESIGN

Thank you for engaging with the brainstorming exercise. As it was a creative exercise, we cannot tell you if your ideas are right or wrong. What we can do is give you an example from a previous workshop that we thought showed the process of designing for values in a nice way.

Given the same exercise the group of people doing the workshop decided to focus on the need for **informed consent** as an important ethics practice in drone data projects. Grappling with the difficulty of ensuring fully informed consent the participants noticed that while many standard drones are **grey**, it may be useful to develop a standard where drones with different purposes can be **recognized from the ground** by their **colour or distinct pattern**. This would give people the opportunity to complain if they spotted a drone collecting data in a place they considered private.

Do you also think this could be an idea to develop further?

QUIZ: POWER RELATIONS

Correct answers are highlighted in bold.

a. Thinking about context in considering ethical aspects of a project is important because:

Possible Answers	Feedback
a. All of the these options.	Well done there is indeed a lot of reasons for why it is important to pay attention to context in deliberating the ethics of a data project.
b. Local ways of thinking about what is 'good' can differ.	Indeed values like privacy may be interpreted differently in different contexts and it makes sense to take this into account. There are however more reasons for why paying attention to context in ethics deliberations is important.
c. Different regulatory landscapes protect ethics to differing degrees.	Regulatory landscapes are important because in some places regulations might protect better than in others. They are not the only reason for paying attention to context in ethics deliberation.
d. Historical context is important for understanding local inequalities.	While historically grown inequalities are particularly important to considering project ethics in context, there are more reasons. Try again.

2. When we talk about power relations as important to ethics what do we mean?

Possible Answers	Feedback
a. Having power is important for charging and flying drones and it is crucial to doing good with a drone data project.	While avoiding drone crashes due to insufficient battery is important, in this lecture we learned about a different type of power, the social power that we have because we have more financial means, more skills or are otherwise in a more privileged position. Try again.
b. Power refers to the ability to influence the world around us. More powerful people, if they abuse that power can harm those in less powerful positions.	Indeed the abuse of power is often a key problem and mitigating it is an important ethics concern in data projects.
c. Power matters to maintaining the status quo, understanding power helps us understand how to keep things as they are.	Power can be about maintaining the status quo in ethics considerations we however often think about how to undo the status quo and improve the lives of those most vulnerable.

3. What do we mean when we are talking about community drone projects?

Possible Answers	Feedback
1. Community drone projects aim to allow the community to define the research problem for a Drone data project. They also aim to transfer as much ownership of the project to local people as possible.	Indeed these are two key characteristics of Community drone projects, some other aspects such as using accessible technologies and ensuring that communities keep the ownership of the data collected for or about them are other characteristics that such projects might strive for.
2. Community Drone Projects are designed by specialist researchers to help a community in need with advanced drone technologies. They aim to engage with communities at the start by asking for permission and once the project is concluded.	Community drone projects try to move away from ideas about good research only being possible with extensive training and see trained researchers as collaborators of local communities, as such, they tend to involve close engagement between researchers and local communities throughout the project life cycle.

LECTURE: DECOLONIAL RESEARCH PRINCIPLES AND INTERSECTIONALITY

Mini-Quiz

Which of the below definitions matches the term Decoloniality and which the term Intersectionality?

Term	Definition
Intersectionality	The interaction of multiple forms of discrimination affecting the daily lived experience of individuals, leading to a compounding of disadvantage.
Decoloniality	Countering historically grown power structures through practices of reciprocity, reflexivity and a focus on transformative research.

DRONE ETHICS CASE STUDY

Mini-Quiz

1. You are an independent Data Responsibility & Ethics Officer and preparing a report advising SKYNET, on the following points:

What kind of data would SKYNET drones most likely collect?

A) Personal data
B) Non-personal Data
C) Group data
D) Sensitive data
E) All of the above.

Feedback:

Answer A-D: Are you sure? With their high-resolution cameras, the SKYNET Drones are likely to collect many different kinds of Data. Read the table on the next page to better understand different kinds of data and how dealing with them adequately is relevant for project ethics.

Answer E: That is correct; the high-resolution cameras and the data processing software used by the SKYNET drone suit are likely to collect and process a lot of different types of data. The table on the next page explains the difference between the different types of data. It also indicates how the protection of such data is usually regulated to highlight that different contexts may make it relevant to rely more on ethical conduct than solely on regulatory requirements to ensure a project remains ethical.

2. Considering the government's approval and provisions of Article 18(2)(g) of the 2021 Malawi Data Protection Bill allowing the use of Drones for humanitarian purposes, would you advise that SKYNET flies its drones over Nsanje and thus disregards the reluctance of the Nsanje community leaders?

Answer	Feedback.
Since SKYNET have government permission it does not matter what the local community thinks about the project and as a knowledgeable foreign drone data company they should take advantage of the opportunity to improve their technologies while possibly helping with disaster relief efforts.	It would not be ethical to simply disregard the reluctance of the local community leaders. While SKYNET is a more powerful actor in this local setting given its knowledge and technology – ignoring the reluctance of the local community would reinforce that power imbalance and make the project questionable from a decolonial perspective.
It is commendable that SKYNET chose to consult the local community. They should take the reluctance of the local community leaders seriously and consider, ideally together with	That is correct! Especially from the perspective of community drone projects disregarding the reluctance of local leaders would risk project ethics. Engaging in dialogue over how the

local actors, why the project proposed is not useful for advancing the needs of the local stakeholders. Ignoring the reluctance to participate in the project would be ethically problematic – even if there is a small chance that the SKYNET intervention might help with coordinating disaster relief operations.	project can be most useful for those most in need and finding approaches that involve local actors in meaningful ways would be preferable. Such efforts should consider the intersecting dis-advantages at play in the study context. While local leaders are often important in developing projects they are themselves in a relative position of power and where possible community drone projects benefit from involving diverse sets of local actors and giving them all a voice in the project design and implementation. Continue to the next page to learn about advising on the scope of the project.

3. In your ethics report, will you recommend that SKYNET should use the data for all their activities?

Answer	Feedback.
Yes, so long as they observe local data protection regulations and don't break the law.	Are you sure about that? From an ethics perspective, several concerns would call for a limited use of data collected. First and foremost since they want to use the humanitarian purpose clause as a grounds for flying their drones, the work they do should primarily contribute to supporting local communities in need in a significant way. There should also be a clear plan for how long the data is stored and for which purpose. Diligent and ethics aware data management is crucial for Drone Projects that collect detailed imagery. SKYNETs approach to harvest data from disaster contexts does not consider how data ownership can be transferred to those who the data is about, it is a predatory approach to conducting data projects which it ethically problematic from a data justice perspective.
No, there should be limits to how they use the data.	Indeed, if Skynet is using the humanitarian intervention clause as a grounds for flying their drones the work they do should contribute to supporting the local communities in need in a significant way. Even if this is not actively policed. There should also be a diligent and ethics aware data management plan that includes considerations about how ownership and future use of the data can benefit those who the data is about. Complete this case study exercise by continuing to the next page.

COMMON HUMANITARIAN DRONE USES AND MILITARY APPLICATIONS

What second use case examples that might be ethically problematic could you come up with? See below for examples we identified.

Case A: **Infrastructure Risk Assessment or Assessing Damage and Choosing targets?**

Infrastructure Risk Assessment

Use case Description: High-resolution aerial imagery, including orthomosaics or 3D models, complements the assessment of the condition and damage to various infrastructures, such as roads, bridges, schools, health facilities, and other structures. Drones provide detailed visual data, enabling infrastructure managers and engineers to evaluate the state of assets efficiently. By conducting aerial inspections, maintenance and repair teams can identify issues, plan interventions, and prioritize resources effectively, ultimately improving the safety and longevity of critical infrastructure.

Assessing Damage and Choosing targets

Use case Description: Assessing achieved damage and where to most effectively destroy critical infrastructure is supported by high-resolution aerial imagery, including orthomosaics or 3D models that help the military to identify locations that can be targeted to create the greatest damage and hardship for local populations.

Report explaining use of drones in Ukraine:

https://www.reuters.com/graphics/UKRAINE-CRISIS/DRONES/dwpkeyjwkpm/

Case B: **Search and Rescue of Missing People or Detecting Migrants Trying to Cross Borders?**

Search and rescue of missing people

Use case Description: Drones are invaluable for conducting aerial searches over expansive areas, providing a broad overview of the terrain and access to ground-level details. Equipped with thermal cameras, drones can detect heat signatures and identify signs of human presence, such as individuals, vehicles, or structures. During search and rescue missions, drones significantly enhance the efficiency of operations, covering large territories more quickly than ground-based teams. The visual data captured by drones aids rescue teams in identifying potential locations of missing persons, enabling timely and targeted search efforts.

Detecting Migrants Trying to Cross Borders

Use case Description: Drones are used for searching large otherwise difficult to traverse terrain in border regions. Using thermal cameras the drones identify individuals trying to cross border regions and local law enforcement agencies use the information gained to help with illegal pushbacks of migrants trying to cross borders.

References to examples:

https://ecre.org/frontex-commission-calls-for-urgent-meeting-over-complicity-in-pushbacks-critique-of-100-million-euro-investment-in-drone-surveillance/

https://algorithmwatch.org/en/greece-plans-automated-drones/

LECTURE: THINKING ETHICALLY ABOUT OPEN DATA

Answers Mini-Quiz

Reasons to keep data open access	**Reasons to keep data with closed access**
Transparency	Power
Cost Saving	Privacy
Research Validation	Dual Use

COMPARE ML AND PEOPLE CLASSIFICATION

Task 1: Identify and number the buildings in the UAV image (picture 1).

The buildings in the area can be categorized by the roofing material (iron-sheet roof vs thatched roofs). Try circling each type with a different pen colour or with a photo editor on a phone.

➔ You might find that you would need good local knowledge to classify these images appropriately.

Task 2: Compare your results to those of an AI algorithm presented to you (picture 2). Do you note any differences between your classification results and the one by AI?

What did you find?

➔ Most people will be able to enumerate and classify the buildings and building types in much more detail than the AI. The AI misclassifies some buildings and some it misses entirely. AI image recognition is getting better, but it is unlikely to ever be perfect.

Task 3: **What kind of adverse effects of AI can you anticipate?**

How could the use of AI in humanitarian interventions adversely affect the neighbourhood when it comes to humanitarian decision making based on the results?

Answer	Feedback
a) Humanitarian housing surveys are often used to decide about where humanitarian action should take place, the neighbourhood may not receive the right aid.	Well done, there may be other concerns but in humanitarian workflows this is a big concern. What follows is a lecture that will give you further insights into the topic of ethics and Drone Image Analysis with AI.
b) Another drone will need to fly even lower over the village to get more detailed data for the machine learning to classify.	Doing so will not resolve the underlying problem and might violate drone flight regulations.

LECTURE: DRONE IMAGE ANALYSIS & AI ETHICS

Answer Mini-Quiz:

Term	**Definition**
Justice	Fair distribution of resources.
Bias	Systematic and unfair discrimination against certain individuals or groups.

Please note this is only one definition of justice, feel free to return to our introductory lecture on what is ethics and why is it important. There we explain the difference between substantial justice (fair distribution of resources) and procedural justice (fair processes in distributing resources).

FINAL REFLECTION ACTIVITY

Wonderful! We hope that those 5 key takeaways align with the learning outcomes you saw at the beginning of the course.

We hope those five key take aways enable you to:

1. Link relevance of ethics to drone data supported projects
2. List key ethics concerns in designing a drone data supported project
3. Recognize multitude of stakeholders effected populations and material objects in Drone Projects
4. Explain key principles of ethics by design in relation to the Drone Data Project life cycle
5. Differentiate how decolonial and intersectional lenses reframe ethics concerns in humanitarian work
6. Critique existing projects (including projects labelled 'ethics proof'
7. Outline possible unintended consequences of the use of a particular data technology
8. Plan project processes with ethics evaluations throughout the project life cycle

These are the learning objectives that we co-created with ADDA and UNICEF staff and we hope the course helped you achieve them. Feel free to come back to this course and to explore the reading suggestions that we made throughout the course.

UNIVERSITY OF TWENTE
Drienerlolaan 5
7522 NB Enschede

P.O.Box 217
7500 AE Enschede

P +31 (0)53 489 9111

info@utwente.nl
www.utwente.nl