

E-waste battery content detection

Batteries, especially Li-po, are highly reactive and can cause accidents, such as fires and explosions that put the lives of the waste processing professionals in danger. They can cause high damages to the environment and the facilities too. This system aims to detect whether a piece of e-waste contains a battery or not. For the time being this system is to be used only on phones and potentially tablets and e-watches and be made up several phases of detections.

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Context of use: Education
Level of education: Bachelor

Technology Impact Cycle Tool

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Impact on society

What impact is expected from your technology?

This category is only partial filled.

What is exactly the problem? Is it really a problem? Are you sure?

The problem is very clear, every year dozens or even hundreds of accidents or fires are reported in waste processing facilities, with a significant impact on all involved. The employees are the first in line and the most affected with their life potentially being at stake. The environment is further degraded and the equipment can be damaged. Additionally, insurance and operating costs are higher because of these. The cause is batteries entering this process.

Are you sure that this technology is solving the RIGHT problem?

This question has not been answered yet.

How is this technology going to solve the problem?

This question has not been answered yet.

What negative effects do you expect from this technology?

This question has not been answered yet.

In what way is this technology contributing to a world you want to live in?

This question has not been answered yet.

Now that you have thought hard about the impact of this technology on society (by filling out the questions above), what improvements would you like to make to the technology? List them below.

This question has not been answered yet.

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Hateful and criminal actors

What can bad actors do with your technology?

This category is only partial filled.

In which way can the technology be used to break the law or avoid the consequences of breaking the law?

While this technology can't be used directly to break the law, a faulty implementation that leads to certain components not being detected will degrade the performance of the entire recycling process which may put contracts and commitments in danger.

Can fakers, thieves or scammers abuse the technology?

This question has not been answered yet.

Can the technology be used against certain (ethnic) groups or (social) classes?

This question has not been answered yet.

In which way can bad actors use this technology to pit certain groups against each other? These groups can be, but are not constrained to, ethnic, social, political or religious groups.

This question has not been answered yet.

How could bad actors use this technology to subvert or attack the truth?

This question has not been answered yet.

Now that you have thought hard about how bad actors can impact this technology, what improvements would you like to make? List them below.

This question has not been answered yet.

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Privacy

Are you considering the privacy & personal data of the users of your technology?

This category is only partial filled.

Does the technology register personal data? If yes, what personal data?

This technology does not register personal data.

Do you think the technology invades the privacy of the stakeholders? If yes, in what way?

This question has not been answered yet.

Is the technology is compliant with prevailing privacy and data protection law? Can you indicate why?

This question has not been answered yet.

Does the technology mitigate privacy and data protection risks/concerns (privacy by design)? Please indicate how.

This question has not been answered yet.

In which way can you imagine a future impact of the collection of personal data?

This question has not been answered yet.

Now that you have thought hard about privacy and data protection, what improvements would you like to make? List them below.

This question has not been answered yet.

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Human values

How does the technology affect your human values?

This category is only partial filled.

How is the identity of the (intended) users affected by the technology?

The identity of the users is not affected by this technology directly. It can be argued that this technology may replace jobs, such as the power loom of the Industrial Revolution, however the current situation points towards the recycling process not taking place at all if the economic circumstances aren't favorable, therefore this technology will likely have the opposite effect, enabling companies to make use of the economy of scale and hire more workers.

How does the technology influence the users' autonomy?

This question has not been answered yet.

What is the effect of the technology on the health and/or well-being of users?

This question has not been answered yet.

Now that you have thought hard about the impact of your technology on human values, what improvements would you like to make to the technology? List them below.

This question has not been answered yet.

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Stakeholders

Have you considered all stakeholders?

This category is only partial filled.

Who are the main users/targetgroups/stakeholders for this technology? Think about the intended context by answering these questions.

Name of the stakeholder

Front-line e-waste workers

How is this stakeholder affected?

-

Did you consult the stakeholder?

Yes

Are you going to take this stakeholder into account?

Yes

Name of the stakeholder

The environment

How is this stakeholder affected?

-

Did you consult the stakeholder?

Yes

Are you going to take this stakeholder into account?

Yes

Name of the stakeholder

Recycling company and rest of personnel

How is this stakeholder affected?

-

Did you consult the stakeholder?

Yes

Are you going to take this stakeholder into account?

Yes

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Name of the stakeholder
Neighbors of the facility

How is this stakeholder affected?

-

Did you consult the stakeholder?

Yes

Are you going to take this stakeholder into account?

Yes

Did you consider all stakeholders, even the ones that might not be a user or target group, but still might be of interest?

-

Now that you have thought hard about all stakeholders, what improvements would you like to make? List them below.

This question has not been answered yet.

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Data

Is data in your technology properly used?

This category is only partial filled.

Are you familiar with the fundamental shortcomings and pitfalls of data and do you take this sufficiently into account in the technology?

Two major shortcomings have been identified regarding the data:

1. Completeness and quality of data is low and needs to be improved before this system can be used efficiently.
2. Errors may still happen and in collaboration with the client the decision was taken to introduce a bias towards marking phones as containing a battery to properly segregate them from the rest and safeguard all stakeholders.

How does the technology organize continuous improvement when it comes to the use of data?

This question has not been answered yet.

How will the technology keep the insights that it identifies with data sustainable over time?

This question has not been answered yet.

In what way do you consider the fact that data is collected from the users?

This question has not been answered yet.

Now that you have thought hard about the impact of data on this technology, what improvements would you like to make? List them below.

This question has not been answered yet.

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Inclusivity

Is your technology fair for everyone?

This category is only partial filled.

Will everyone have access to the technology?

This question has not been answered yet.

Does this technology have a built-in bias?

This technology has a bias in the form of the data that is used to train the model. Due to this some of the devices may be miss-detected. At the time being it is known that the data is also of somewhat poor quality and this does have a knock-on effect on the model being biased and producing different predictions depending on the conditions, thus reliability can't be guaranteed.

Does this technology make automatic decisions and how do you account for them?

This question has not been answered yet.

Is everyone benefitting from the technology or only a a small group?

Do you see this as a problem? Why/why not?

This question has not been answered yet.

Does the team that creates the technology represent the diversity of our society?

This question has not been answered yet.

Now that you have thought hard about the inclusivity of the technology, what improvements would you like to make? List them below.

This question has not been answered yet.

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Transparency

Are you transparent about how your technology works?

This category is only partial filled.

Is it explained to the users/stakeholders how the technology works and how the business model works?

Yes, constant communication going into the specific aspects of this technology have been made with the client, receiving adjustments as needed based on the feedback provided. Further, documentation is to be created to explain in detail this technology.

If the technology makes an (algorithmic) decision, is it explained to the users/stakeholders how the decision was reached?

This question has not been answered yet.

Is it possible to file a complaint or ask questions/get answers about this technology?

This question has not been answered yet.

Is the technology (company) clear about possible negative consequences or shortcomings of the technology?

This question has not been answered yet.

Now that you have thought hard about the transparency of this technology, what improvements would you like to make? List them below.

This question has not been answered yet.

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Sustainability

Is your technology environmentally sustainable?

This category is only partial filled.

In what way is the direct and indirect energy use of this technology taken into account?

The energy consumption of this system has not be evaluated directly, however efficiency across multiple steps of the way have been assessed and improved, indirectly improving this factor. Ultimately the effect is expected to be fairly low and the scale of this system remains limited compared to the facility's existing consumption, a single computer could run at its maximum power for the duration of the work-day and be orders of magnitude below the conveyor belt system's consumption.

Do you think alternative materials could have been considered in the technology?

This question has not been answered yet.

Do you think the lifespan of the technology is realistic?

This question has not been answered yet.

What is the hidden impact of the technology in the whole chain?

This question has not been answered yet.

Now that you have thought hard about the sustainability of this technology, what improvements would you like to make? List them below.

This question has not been answered yet.

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Future

Did you consider future impact?

This category is only partial filled.

What could possibly happen with this technology in the future?

This technology at the time has a very specific and narrow scope. In the future this model can become more multi-purpose, going beyond e-waste battery content to being a multi-purpose detector. Another task we have is to work with Mercury content detection in imaging monitors, such as TVs. These could thus be combined and further functionalities added. In the future this technology could thus take over more and more waste recycling tasks, taking away jobs often held by marginalized and/or less educated people.

Sketch a or some future scenario (s) (20-50 years up front) regarding the technology with the help of storytelling. Start with at least one utopian scenario.

This question has not been answered yet.

Sketch a or some future scenario (s) (20-50 years up front) regarding the technology with the help of storytelling. Start with at least one dystopian scenario.

This question has not been answered yet.

Would you like to live in one of this scenario's? Why? Why not?

This question has not been answered yet.

What happens if the technology (which you have thought of as ethically well-considered) is bought or taken over by another party?

This question has not been answered yet.

Impact Improvement: Now that you have thought hard about the future impact of the technology, what improvements would you like to make? List them below.

This question has not been answered yet.