

# Baby Don't Cry

An app that 'listens' to a crying baby and analyzes the crying. The app knows if the baby is hungry or tired or in pain (for example)

The app is trained on over 200.000 crying babies and can be personalized on your baby. The analysis is 80% accurate for identifying a baby's emotional state.

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## Impact on society

What impact is expected from your technology?

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

Being a new parent can be stressful. Having a baby is new and parents are often insecure. Why is the baby crying and how can we comfort the baby? The app helps parents to analyse the crying of the baby. This accounts for parents that have more confidence, are less insecure and therefore have a more positive influence on the wellbeing of the baby. The app therefore is primarily designed to increase the wellbeing of the baby by boosting the confidence of the parents.

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

A parent that is insecure or stressed out can have a very negative effect on a baby. We believe that babies are very sensitive for the emotional state of the parents and stressed parents can have a very negative effect on the development of the baby.

We see our app as a support system for new parents. The app does not replace the intuition of the parent, but supports the decision.

### **How is this technology going to solve the problem?**

We trained our app on 200.000 different crying babies. In our dataset we know the right labels for the different crying sounds. We learned our software through AI to learn to analyze the sound of a crying baby.

We have not yet done scientific research in the results however we believe our results to be 80% accurate.

We communicate to our clients that the app should be used as a support system, not as a replacement for feelings or intuition.

### **What negative effects do you expect from this technology?**

There are some negative effects we fear. Maybe parents will become dependent on the app and trust the app more than their own feelings. In that case wrong conclusions of the app can lead to mistreatment of the baby.

It is also possible that the app reaches a wrong conclusion (the baby is hungry) so feeding the baby does not lead to the wanted result. This can cause more anxiety with the parents.

### **In what way is this technology contributing to a world you want to live**

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**in?**

We strongly believe that confident, relaxed parents have a great impact on the wellbeing of babies. We like to contribute to that.

Also we believe that technology can be a great servant for humans and our app can be a great servant for parents.

**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.**

We added a probability of the analysis. We no longer say the baby is hungry but we say the baby has 80% chance of being hungry (for example). We also make sure that we have a well documented user guide that instructs parents to work together with the app.

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## Hateful and criminal actors

What can bad actors do with your technology?

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

We do not really see any way that our technology can be used to break the law or avoid facing the consequences of breaking the law.

### **Can fakers, thieves or scammers abuse the technology?**

Not really. We see our technology exactly the same as a for example a baby monitor.

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

We do not think so.

### **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.**

We do not say how this can be done.

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

Maybe hackers could steal or manipulate the outcomes of the analysis so parents get the wrong information. However we think this is very farfetched.

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

Considering the nature of our solution we did not think improvements are in order to mitigate the risks of bad actors.

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## Privacy

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

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

Yes, it does. We ask the user of the app to give information on the gender and race of the baby. We do this, so we can improve our app. Also, we ask the user to give information like a name and address.

We trained the app with data of crying babies that is anonymized.

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

You do not have to use the app. If you use it, there is a certain invasion of privacy, because we need to know all kinds of things of you and the baby to make sure our app performs as good as possible. We also anonymize the data and use it for research.

We believe people won't feel that their privacy is invaded, because using the app is a voluntary choice. Also we are very careful that we only register data that is absolutely necessary.

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

Yes, we checked our procedures with the GDPR and we are compliant.

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

We are walking a thin line here, because having more data means we can better improve our app and it means we are able to do research on the wellbeing of babies. That means in certain cases that we collect more data than necessary for the functionality of the technology.

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

We do not see any problems here. We do not think that if anyone ever found out, that you cried a lot as a baby, that this is a problem.

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

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We will be even more transparent about why we are collecting data and try to anonymize more data, so we can balance data minimalisation and improving our app.

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## Human values

How does the technology affect your human values?

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

This is something we worry about. We want our users to be good parents.

We do not want to give the impression that an app can replace parental instincts. However parenting is something you have to learn and can be stressful. That is why we want to support parents with our app. It helps you to become the young parent you want to be.

### How does the technology influence the users' autonomy?

We are very clear about the use of our app. It is meant to support parents in making good decisions. The app is not meant to be to decide for parents.

That is why we always indicate how sure we are about the analysis of the crying baby.

The app is really simple so young parents can use them themselves. Because the app is only there for support, it is not making users dependent.

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

The idea of the app is that it helps young parents. It should give them more confidence and help them become less stressful. However, we understand that if the app tells you the baby is probably hungry and you feed the baby, but the baby does not stop crying, this can cause anxiety. That is why we are very committed to explaining to parents what is the best way to use the app.

### 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.

We understand that our app will probably be bought by parents that are a bit insecure about their parenting. That is why we take extra care in explaining that the app is only a support system for making good decisions. You should never let the app make decisions for you!

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## Stakeholders

Have you considered all stakeholders?

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

**Name of the stakeholder**

The baby

**How is this stakeholder affected?**

The app helps the parents of the baby so the baby gets the best possible care

**Did you consult the stakeholder?**

Yes

**Are you going to take this stakeholder into account?**

Yes

**Name of the stakeholder**

The Parents

**How is this stakeholder affected?**

The app helps the parents analyzing the baby's cry

**Did you consult the stakeholder?**

Yes

**Are you going to take this stakeholder into account?**

Yes

**Name of the stakeholder**

Grandparents

**How is this stakeholder affected?**

Maybe parents will expect grandparents that take care of a baby also to use the app

**Did you consult the stakeholder?**

Yes

**Are you going to take this stakeholder into account?**

Yes



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Name of the stakeholder  
Consultancy agencies

**How is this stakeholder affected?**

The app can be a support tool for parents that are stressed out because of the care of their baby.

**Did you consult the stakeholder?**

Yes

**Are you going to take this stakeholder into account?**

Yes

**Name of the stakeholder**

Privacy Organisations

**How is this stakeholder affected?**

Because the app is about babies which are vulnerable, maybe they will be extra critical on the privacy aspects of the app

**Did you consult the stakeholder?**

Yes

**Are you going to take this stakeholder into account?**

Yes

**Name of the stakeholder**

Researchers

**How is this stakeholder affected?**

The data of the app can be very valuable to improve care for babies

**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?**

**Name of the stakeholder**

Woke - people

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How is this stakeholder affected?

In our software we make a distinction between gender and race to get the best result. We have to be careful not to offend people

**Did you consult the stakeholder?**

No

**Are you going to take this stakeholder into account?**

Yes

**Name of the stakeholder**

Day care

**How is this stakeholder affected?**

The baby often is cared for by day care organisations. Maybe parents will demand the app to be used.

**Did you consult the stakeholder?**

No

**Are you going to take this stakeholder into account?**

Yes

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

By doing a stakeholder analysis we now better understand that often the parents are not the only ones that take care of a baby. There is also (for example) grand parents and day care. We must ensure that we take these targetgroups into account.

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## Data

Is data in your technology properly used?

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

Very much. We understand that we only listen to the baby. We do not monitor other things (like temperature of heart rate). We also know that background noise can influence our analysis. That is why we are careful to communicate that our app is only correct 80% of the time and parents should be aware of false positives or negatives.

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

There is no feedback in our dataloop. This can be positive because there is no self-fulfilling prophecy but also negative because improvement is slow. For now we have no plans using other data than the sound of a crying baby.

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

We analyzed over 200.000 babies crying. This data is anonymous and growing. This data can not be tracked back to the baby, which makes it very sustainable.

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

We do not sell or share user data. All data is used for the functionality of the app and shared with researchers (in an anonymized form).

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

Our users only use the app for a limited period of time. If they stop using it we will create a procedure that enables the user to choose if they want their data deleted or (anonymously) shared with our company and researchers so we can improve baby care.

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## Inclusivity

Is your technology fair for everyone?

### **Will everyone have access to the technology?**

Yes. Everyone with a smartphone can use our app. We make sure our app can also be used on older smartphones. There is a subscription license, in which you pay per analysis, so even people with a low budget can try the app and use it accordingly.

The app is a support system, so there will be no big differences between the "haves" and "have-nots".

### **Does this technology have a built-in bias?**

We made sure the data in our app was collected from babies from all kind of races and gender. However, we are continuously improving with new data by users from the app. These users are often caucasian and it are parenst that really care about their baby or parents with problem babies.

That is why we have a large group of researchers to help us find an correct biases.

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

The technology makes automatic decisions all the time. These decisions are explained in general terms on our website and every time a decision is reached, we tell the user how sure we are about our analysis.

The decisions can not be explained because the machine learning algorithms make their own decisions in a black box.

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

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

We think everyone is benefitting and that the app is not 'important' enough to really impact social relations and economical opportunities

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

No.

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

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**below.**

We are really committed to hiring a more diverse workforce. We are growing fast and aim to hire more women and people from different backgrounds and races. The same goes for our researchers. We believe this will help improve our app.

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## Transparency

Are you transparent about how your technology works?

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

Yes, we are very clear about that. Our app reaches conclusions using machine learning in a black box based on 200.000 crying babies. We make money by selling licenses, we do not sell or share data.

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

It is not. It is not possible. We only explain in general terms which data we collect and how we use algorithms that analyze the data. We can not explain or discuss individual analysis by the app.

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

Yes, we have a contact form on the website and in the app. We are open for questions from users, but also media and researchers. However we can not share our data or algorithms because we want to maintain our competitive edge.

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

Yes, there are two important shortcomings we communicate. First, our analysis is only 80% correct. We tell this with every analysis. Secondly using our app can also cause anxiety if you do not use it as a support system.

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

We are thinking about creating an user community. In this community parents can talk about using the app. Our goal is that the app helps the parents and also the parents help each other.

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## Sustainability

Is your technology environmentally sustainable?

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

Our servers are hosted in green datacenters. The app has a license system so it is only used when a parent decides to 'listen' to a crying baby. There is no always-on-app. Also, you do not have to buy a new phone for the app. The app runs on older model phones.

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

Not relevant.

### Do you think the lifespan of the technology is realistic?

Yes.

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

There is not much of a hidden impact.

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

In the future we will research if it is possible to have some processes run locally instead of in the datacenter. This way we can further reduce our ecological footprint.

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## Future

Did you consider future impact?

### **What could possibly happen with this technology in the future?**

We envision a future in which machine learning becomes better and our app improves a lot. Using an app to analyze your baby's crying will be standard for all care takers and will greatly improve the care for babies. In some countries the app will be provided for by health Insurance companies. The app will just be something that is very normal in a world full of artificial intelligence.

### **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.**

Karen is a single, young parent with a busy job. Her baby (George) is a demanding baby. Luckily Karen uses an app that tells her exactly what is wrong with George. This way she knows when to feed him, when to comfort him and when there is really something wrong.

The app makes sure Karen feels confident on being a parent, especially because she is alone. She also knows the app is used by professional organizations and continuously improved by researchers. This gives her comfort.

The parents of Karen and her sister also use the app when they look after George.

Of course she does not use the app all the time and still trust her own instincts.

### **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.**

Karen lives in a world in which artificial intelligence is really intelligent. Making your own decisions in a lot of cases is not seen as responsible behavior.

Her baby: George cries a lot. So Karen uses her app to see what she has to do. Sometimes she feels as a mother that there is something else going on, but Karen would not dream of not following the app.

After all her health Insurance company and the day care organizations can also see how often and long George has cried. Parents with babies that cry to much are frowned upon by the community.



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Karen had heard of some secret community somewhere in the woods in the Midlands that raises babies without technology sometimes she dreams of that, but most of the time she thinks these people are barbaric.

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

Using technology in a relationship that is as precious as parents and new born is never a good idea. Even if a baby cries a lot and a parent gets really tired of stressed out, this is still a very valuable experience.

Suffering is part of being a parent. Children when they grow up should look back at their parents as people that made sacrifices not as people that had great technology that made everything frictionless.

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

Maybe, the technology will no longer be something that support parents, but something that is more obligated to use. We have taken no measures to prevent this.

## **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.**

We believe in a world in which the precious relationship between parent and new born is supported by some technology in some cases. We will continue to promote that way of thinking to prevent our app becoming too important.