


NAME: Feedback mechanisms for image quality

DATE: December 15, 2025 8:22 PM


DESCRIPTION OF TECHNOLOGY

I am developing a prototype web application to test various feedback mechanisms on users. The goal is to guide them to take better, more useful photos for fossil identification. To validate the results, there will be a baseline prototype and two more to test feedback mechanisms. The images taken by testers are collected and then compared based on five metrics. Sharpness, lighting, contrast, number of angles and...




HUMAN VALUES

In the prototype version of this technology, the focus is on testing AI-supported feedback for taking better fossil images, but even in this limited form, it still affects how users see themselves and how they participate in the process. Instead of simply uploading photos, users learn how to capture clearer, more useful images through real-time guidance. This helps fossil enthusiasts feel more capable and confident, turning them from casual contributors into users who understand what good scientific documentation looks like....




TRANSPARENCY

In my project, transparency about how the prototype works and its goals is a very important aspect. The technology is designed as an academic, non-commercial initiative, so no business model is involved. The goals are clearly communicated: the prototype supports the LegaSea project by helping reconstruct Dutch Ice Age biomes. Its immediate purpose is to improve the quality and quantity of fossil images and metadata, while also educating fossil enthusiasts on collecting research-grade data. The...




IMPACT ON SOCIETY

This technology tackles poor data quality in citizen-submitted fossil images, which limits both scientific usefulness and AI performance in the LegaSea project. Submissions are often blurry or incomplete, feedback is slow, and users receive little guidance, resulting in data that experts struggle to validate and AI models struggle to learn from. By adding real-time capture guidance and a more natural, narrative input flow, the system aims to produce higher-quality fossil data and a smoother user experience....




STAKEHOLDERS

- Fossil hunter / Citizen scientist
- Paleontologists / fossil validators
- AI developer at Naturalis
- Fontys side product owner




SUSTAINABILITY

In my prototype, energy use is addressed through resource-efficient AI, focusing on minimizing power consumption on user devices. The AI components are optimized to run on low-power smartphones using techniques like quantization and on-device inference. By performing real-time processing locally, the system eliminates network latency and does not use another cloud server to run the backend. Currently, the web app requires an internet connection both to access the app and to submit data. Offline capability is...




HATEFUL AND CRIMINAL ACTORS

This technology will be used within an AI-supported citizen science app for improving fossil documentation, user engagement, and data quality. Although designed for scientific and educational purposes, its use of mobile cameras, timestamps, and location results in risks involving privacy, data handling, and information integrity. Because the app collects images and location data, users could accidentally or intentionally capture people, private property, or sensitive locations, creating privacy concerns. It...




DATA

In the prototype, I address the weaknesses of citizen science fossil data by testing real-time AI feedback to reduce poor and inconsistent image quality. LegaSea studies show that user-submitted photos are often blurry or poorly lit, and AI models trained on them perform worse than on controlled images. The prototype provides instant feedback during image capture, helping users avoid common mistakes before making a submission. I also recognize that human judgment is subjective. Initial...




FUTURE

In my project, the technology is designed to help citizen science data collection and has the potential for a larger impact. If scaled to a million users, it could change data standards, user habits, and the interaction between amateur and professional scientists. With real-time AI guidance, users would learn to consistently produce research-grade data, making high-quality, standardized documentation the norm. This would greatly improve AI model accuracy, which currently suffers when...




PRIVACY

This prototype also processes personal data, even though it is not a full application. Its purpose is to test feedback mechanisms for improving image quality, but doing so still needs the handling of information that falls under GDPR. The prototype collects fossil images, a title for each submission, and the location of the find. If the submission needs to be linked to a survey, it will likely also collect a user name so responses can be matched correctly. Even in this limited form, the combination of images, names,...






INCLUSIVITY

In my prototype, while I aim to reduce the bias of low-quality citizen data, the system itself introduces several built-in biases related to reference data, technical requirements, and prescriptive guidance. The most obvious bias comes from the quality benchmark. Real-time feedback is based on 100 fossil images graded by a single expert, creating a gold-standard bias toward one person's judgment. The feedback also enforces a museum-like aesthetic: white backgrounds, consistent lighting, and a...



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HUMAN VALUES



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

To help you answer this question think about sub questions like:

- If two friends use your product, how could it enhance or detract from their relationship?
- Does your product create new ways for people to interact?...

TRANSPARENCY



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

- Is it easy for users to find out how the technology works?
- Can a user understand or find out why your technology behaves in a certain way?
- Are the goals explained?
- Is the idea of the technology explained?
- Is the technology company transparent about the way their...

IMPACT ON SOCIETY



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

Can you exactly define what the challenge is? What problem (what 'pain') does this technology want to solve? Can you make a clear definition of the problem? What 'pain' does this technology want to ease? Whose pain? Is it really a problem? For who? Will solving the problem make the world better? Are you sure? The problem definition will help you to determine...

STAKEHOLDERS



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

When thinking about the stakeholders, the most obvious one are of course the intended users, so start there. Next, list the stakeholders that are directly affected. Listing the users and directly affected stakeholders also gives an impression of the intended context of the technology.
...

SUSTAINABILITY



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

One of the most prominent impacts on sustainability is energy efficiency. Consider what service you want this technology to provide and how this could be achieved with a minimal use of energy. Are improvements possible?

HATEFUL AND CRIMINAL ACTORS



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

Can you imagine ways that the technology can or will be used to break the law? Think about invading someone's privacy. Spying. Hurting people. Harassment. Steal things. Fraud/identity theft and so on. Or will people use the technology to avoid facing the consequences of breaking the law (using trackers to evade speed radars or using bitcoins to launder...

DATA



Are you familiar with the fundamental shortcomings and pitfalls of data and do you take this sufficiently into...

There are fundamental issues with data. For example:

- Data is always subjective;
- Data collections are never complete;
- Correlation and causation are tricky concepts;
- Data collections are often biased;...

FUTURE



What could possibly happen with this technology in the future?

Discuss this quickly and note your first thoughts here. Think about what happens when 100 million people use your product. How could communities, habits and norms change?

PRIVACY



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

If this technology registers personal data you have to be aware of privacy legislation and the concept of privacy. Think hard about this question. Remember: personal data can be interpreted in a broad way. Maybe this technology does not collect personal data, but can be used to assemble personal data. If the technology collects special personal data (like...

INCLUSIVITY



Does this technology have a built-in bias?

Do a brainstorm. Can you find a built-in bias in this technology? Maybe because of the way the data was collected, either by personal bias, historical bias, political bias or a lack of diversity in the people responsible for the design of the technology? How do you know this is not the case? Be critical. Be aware of your own biases....

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