MATLAB tool

Calculation tool for cam designs

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Context of use: Work
Level of education: Bachelor

Technology Impact Cycle Tool

MATLAB tool

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 addressed in this project is not the absence of a cam design method, but the limitations of the existing workflow (Cam Design Workflow 2.0).
The current approach relies on fragmented tools, manual steps, and limited validation, which makes it time-consuming, error-prone, and difficult to scale or reuse across different cam designs.

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.

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?

The technology developed in this project is intended as an engineering decision-support tool. However, like many calculation and validation tools, it could potentially be misused to circumvent engineering standards or legal responsibilities if applied incorrectly or unethically.

One possible misuse is the intentional manipulation of input parameters to obtain favourable calculation results.

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.

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?

No, the technology does not register or process personal data.
The developed Cam Design Tool operates purely as a technical engineering calculation and validation tool. All inputs and outputs relate exclusively to mechanical, geometrical, material, and operational parameters, such as loads, velocities, material properties, and calculated lifetimes.

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.

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 technology does not affect users' personal identity with respect to personal data, privacy, or self-representation. However, it influences the professional roles and responsibilities of the intended users, who are design and systems engineers.

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.

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
JBT Marel Design engineers

How is this stakeholder affected?
-

Did you consult the stakeholder?
No

Are you going to take this stakeholder into account?
No

Name of the stakeholder
JBT Marel Manufacturing and Process Engineers

How is this stakeholder affected?
-

Did you consult the stakeholder?
No

Are you going to take this stakeholder into account?
No

Name of the stakeholder
Project Supervisor

How is this stakeholder affected?
-

Did you consult the stakeholder?
No

Are you going to take this stakeholder into account?
No

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.

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?

Engineering data are inherently subject to limitations, including measurement uncertainty, assumptions in analytical models, variability in material properties, and incompleteness in supplier or experimental datasets. In particular, lifetime and wear data often relies on simplified models or empirical test conditions that may not fully represent real operating environments.

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.

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?

The technology does not contain intentional bias toward specific users or outcomes. However, like any engineering calculation tool, it does exhibit implicit technical bias arising from its underlying assumptions, data sources, and modelling choices.

The primary source of bias lies in the use of predefined models and supplier-based reference data.

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.

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, the technology's operation is explained to users and key stakeholders at a level appropriate to their roles. The tool is designed to be transparent in its operation, ensuring that users understand how results are generated and what assumptions underlie the calculations.

For end users (design engineers), the technology is explained through:
A clear and structured user interface that reflects the underlying calculation flow.

Documentation describing input parameters, assumptions, and output interpretation

Traceability between user inputs, calculation models, and results

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.

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 technology's direct energy use is relatively low and is primarily limited to the computational resources required to run the software. The tool operates on standard engineering workstations using MATLAB and does not require specialised hardware or continuous high-performance computing. As such, direct energy consumption is comparable to that of typical engineering design software and is considered negligible within the overall project context.

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.

Future

Did you consider future impact?

This category is only partial filled.

What could possibly happen with this technology in the future?
In the future, the technology could evolve beyond its current role as a standalone engineering calculation tool and become a more integrated part of the overall mechanical design workflow. As additional modules are added, such as advanced dynamic analysis, manufacturability assessment, or automated optimisation, the tool could support more comprehensive design decisions earlier in the development process.

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.