



Research in Engineering Design

Thought regarding writing good papers

Source: <http://www.eng.tau.ac.il/~yoram/RED/redGuidelines.html>

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Based on

- My own experience publishing in close to 30 different journals and failing in publishing in few others
- reviewing / managing the review of some hundreds papers
- ... and based on the experience of others as compiled from various discussions

Comments / Improvements / Discussions are welcome

3 (potentially overlapping) perspectives

- How to view your research through the **lens and beast metaphor**
- Paper/research as the **product of designing**
- A list of guidelines compiled from diverse experiences

The “lens” and the beast metaphor*

Short summary

You can view your research as an animal you are creating and observing simultaneously. There is a difference between what you create and what you see because you look at your work through some worldview (perspective) which allows you to focus on particular aspects and hinders your vision of other aspects. By using different perspectives including zooming onto the beast, you are able to focus on different aspects.

Similar to you, other people including editors, reviewers, readers and future referees, view your work through their lenses. Given the differing lenses, they may see a completely different beast than you. If you want them to appreciate what you did or see things like you, tell them which lens to use or explain to them how you use your lens and why do you see the things you see.

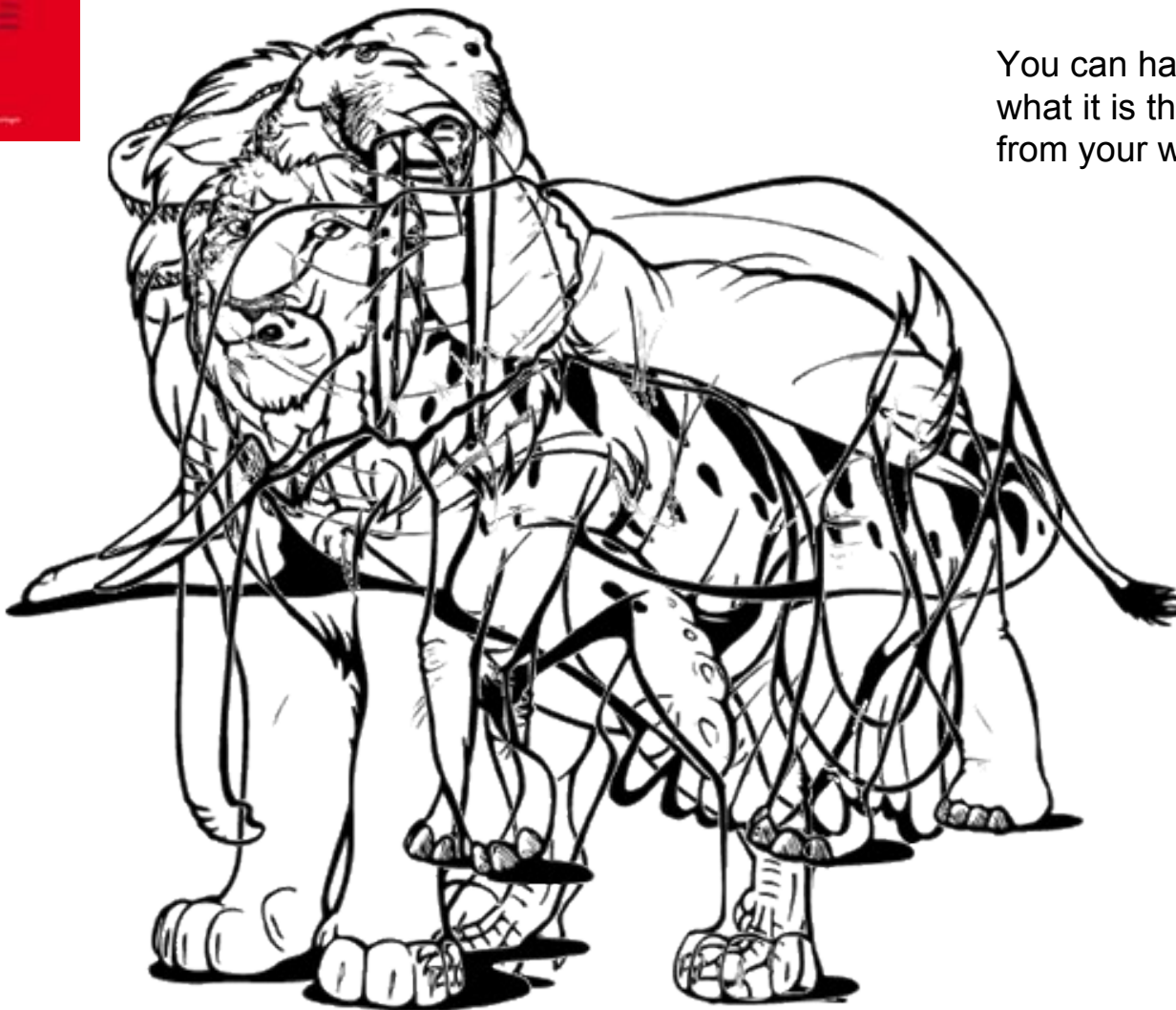
***This metaphor was first presented at the 4th design theory SIG meeting in Paris
31.1.11-1.2.11**

**Eswaran Subrahmanian, Yoram Reich, Frido Smulders, Sebastian Meijers
Designing: Insights from Weaving Cognitive Theories**

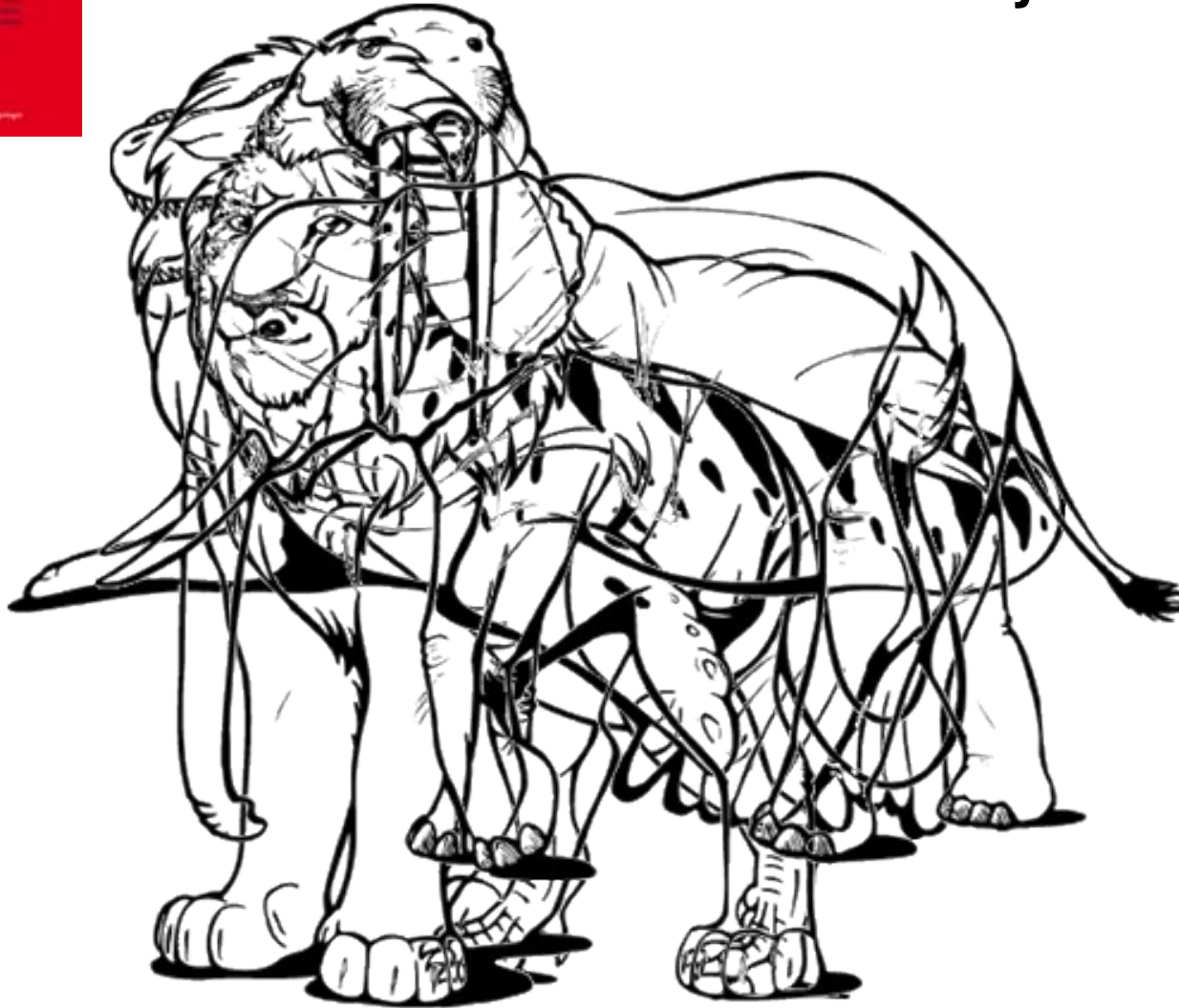
It is also a part of a submission to ICED 2011 and to IASDR 2011 by the same

Here is your research / future paper

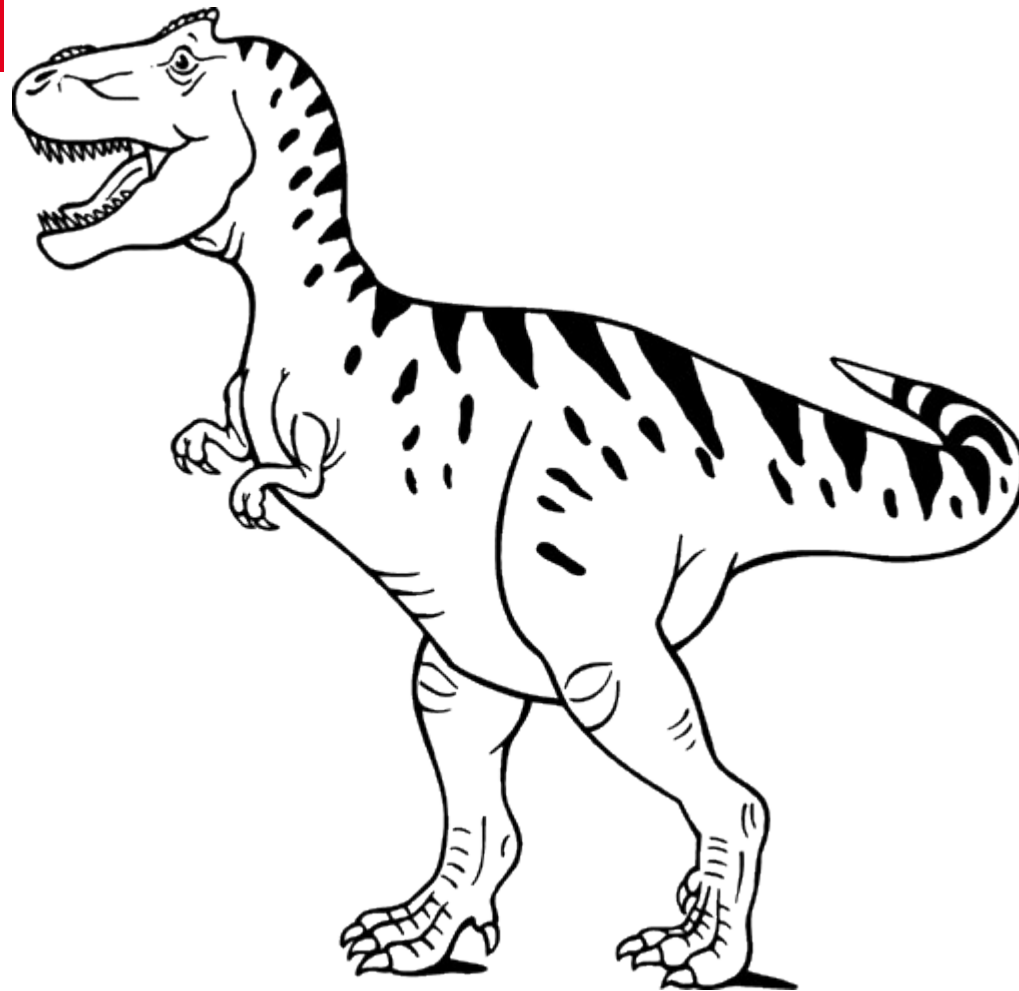
You can hardly identify
what it is that is emerging
from your work



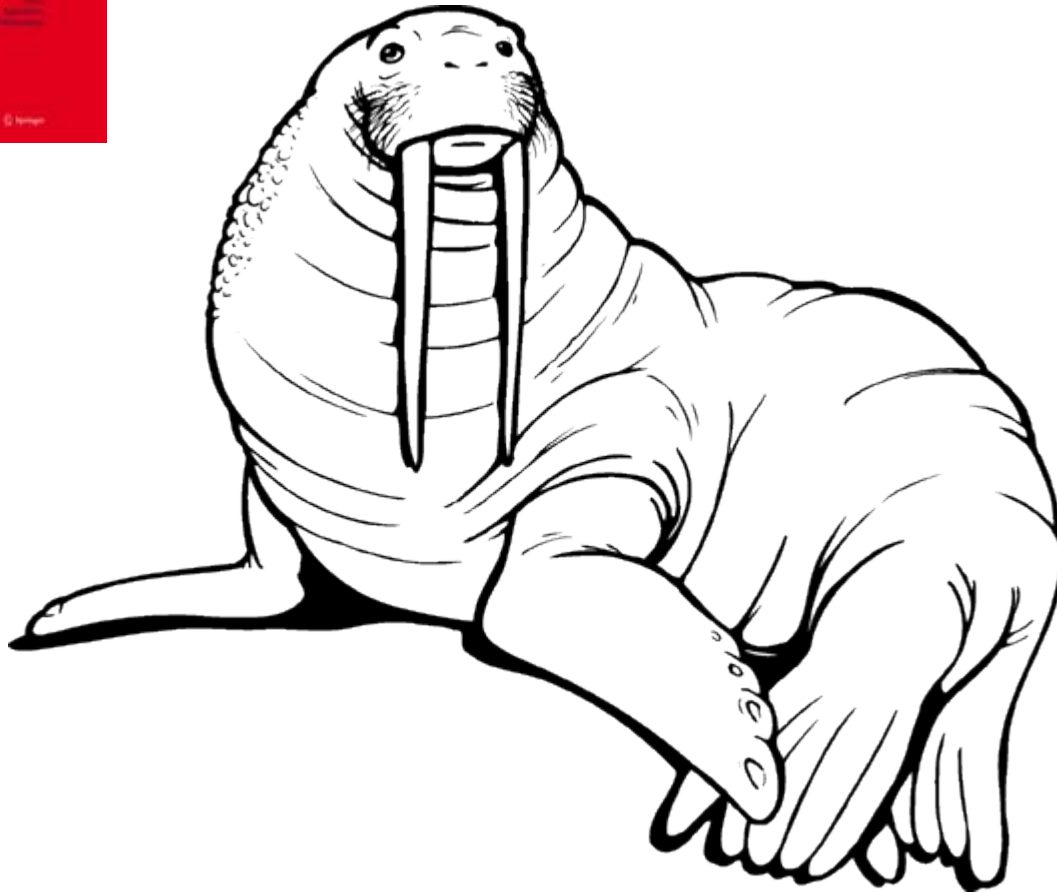
You are looking at it trying to make a sense what to do based on what you see



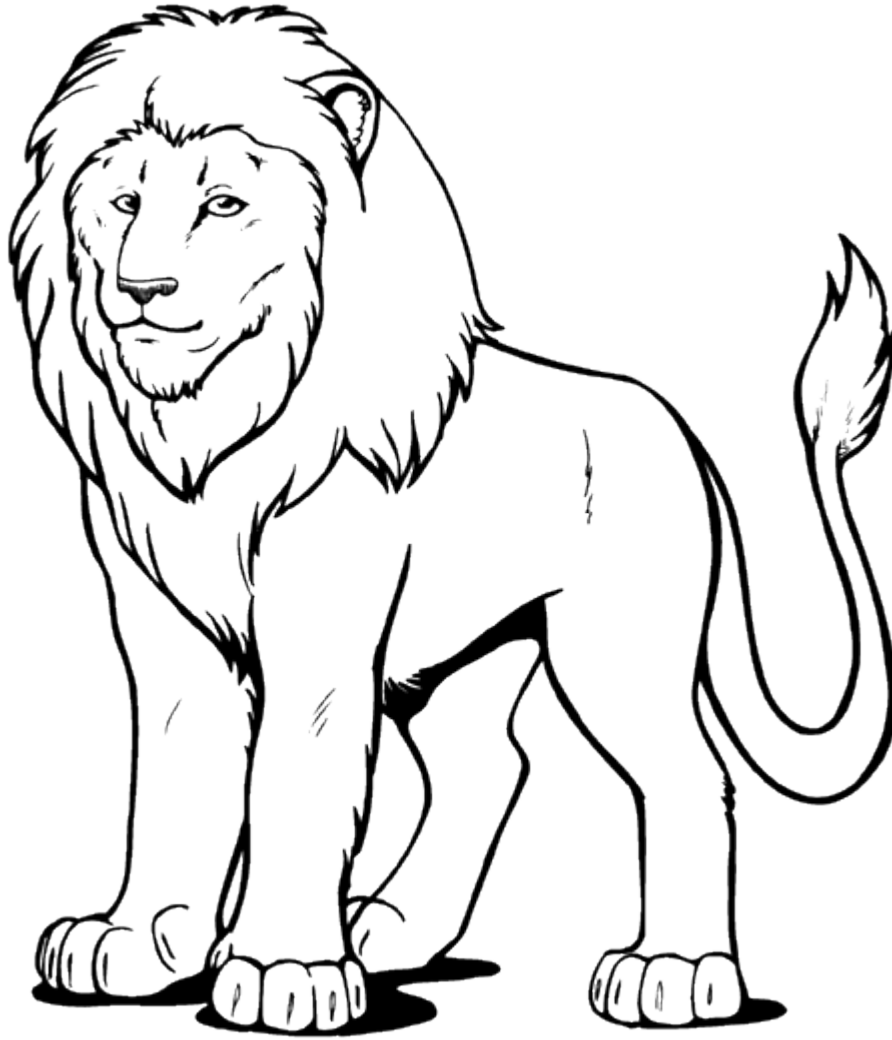
Is it a dinosaur?



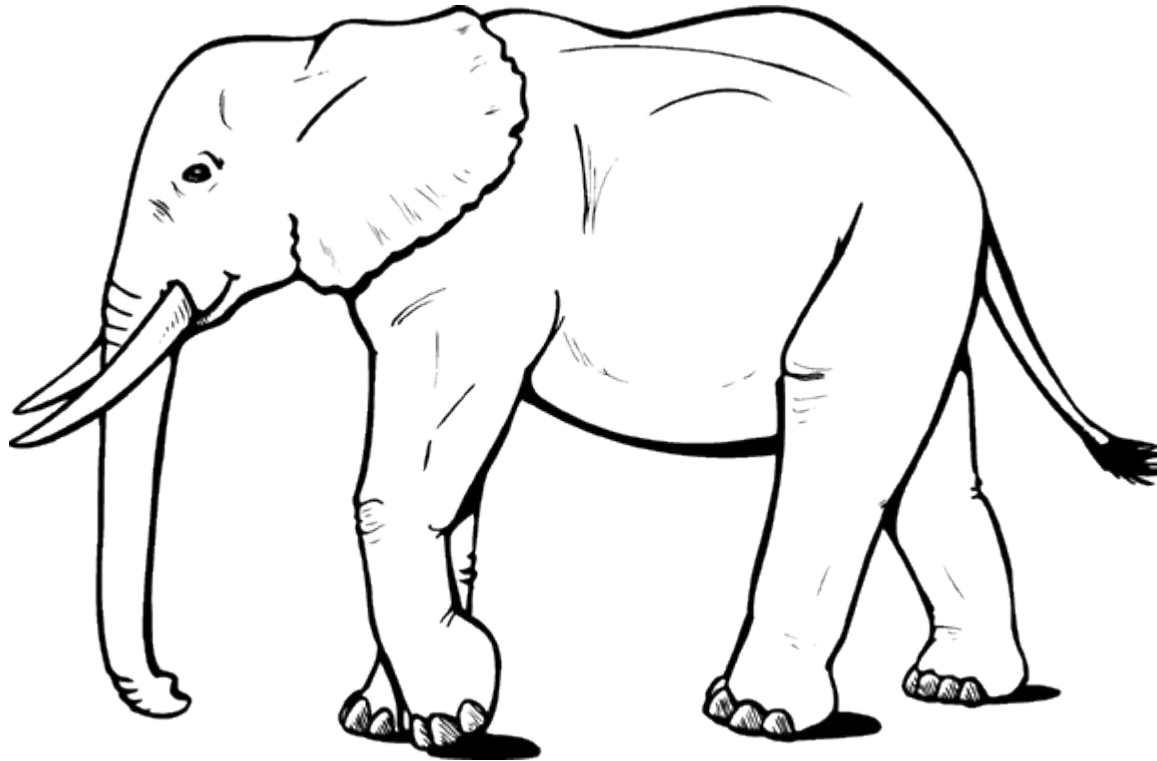
Is it a walrus?



Is it a lion?



Is it an elephant?



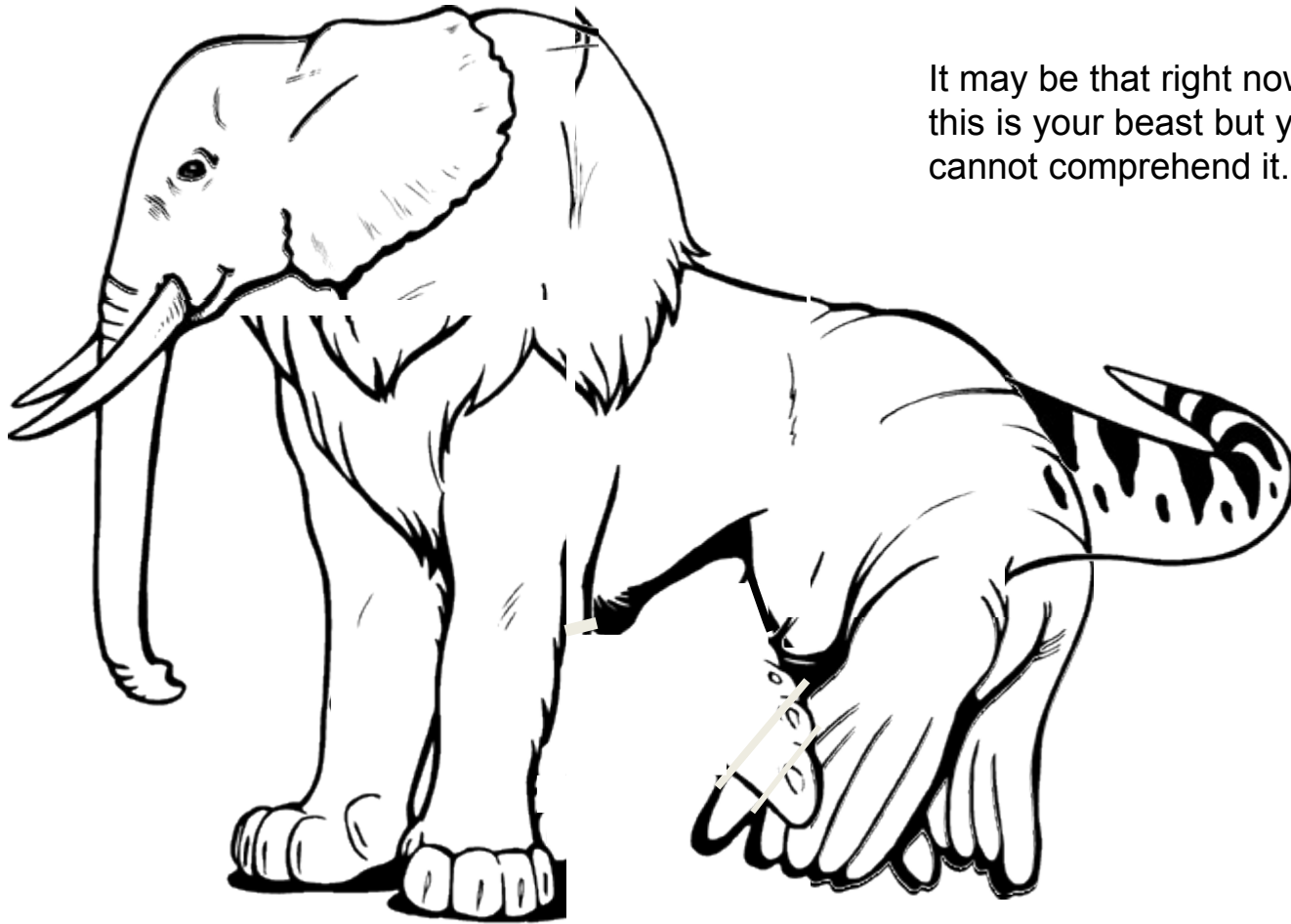
You can select a particular perspective, and therefore determine the kind of x-cular you use:
Monocular, binocular, X-cular (for n -eyed researcher)



With binoculars and fitted (*designed*) lenses, you could get a better focused view of your beast



Eliodinalrus (el_ephant lio_n din_osaur walrus)



It may be that right now
this is your beast but you
cannot comprehend it.

You can divide the beast and address each part



Here are different topics of your research or different papers you can write on it.



Focus on small part and address it

Creating
creative ideas

?



Sometimes you may end up focusing on a particular issue highlighting it. At that moment you might need to study an unfamiliar discipline to be able to understand it and put this work into the right perspective. If this is an unfamiliar territory, you might fail. Beware!

?

Bridging the gap between 2 parts of your work

Fix according to reviewers comments

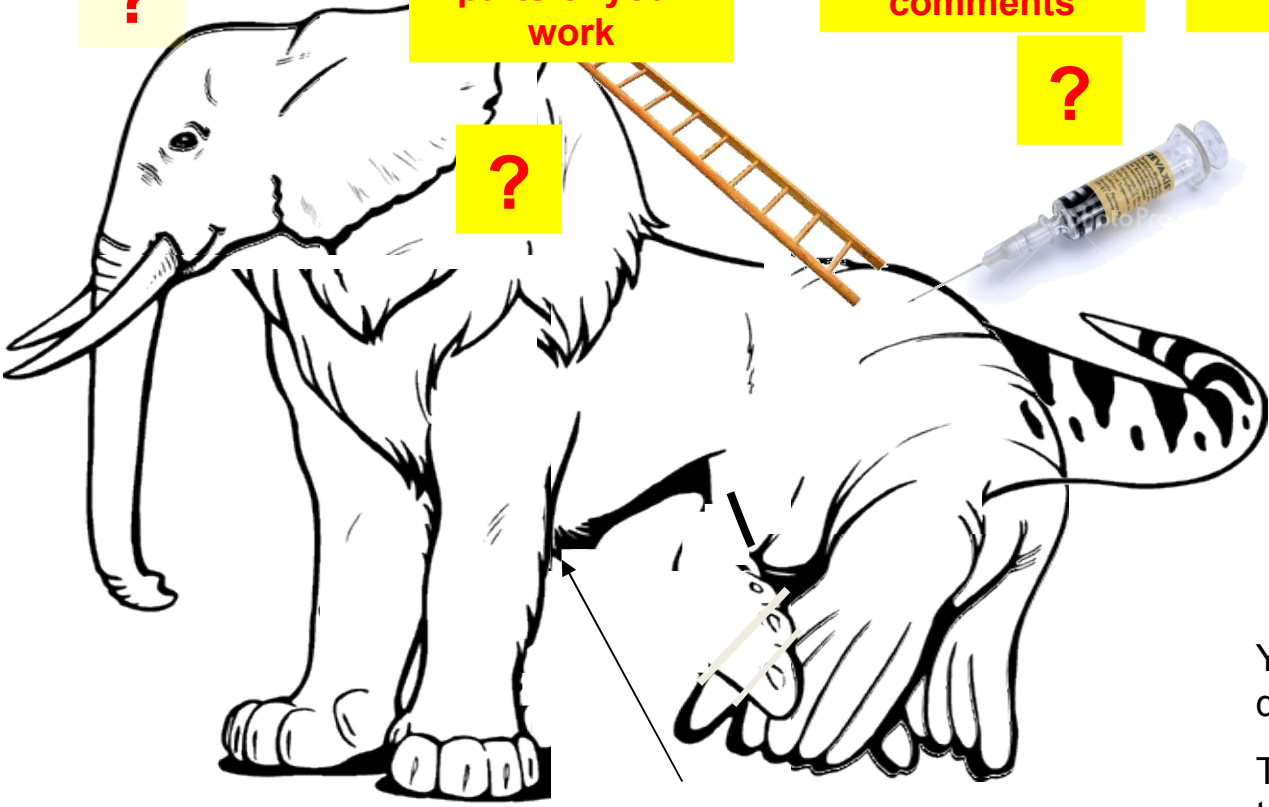
Empirical, cognitive, utility, ...

Authors, reviewers editors, ...

?

?

?



?

?

Missing part in your research that could fail it



You can use this metaphor in different ways – be creative!

The observer could be reviewers trying to make sense out of your work or those whom you ask to fund your research.

The lens might be a particular way to study such as through empirical tests or theoretical analysis.

A paper/research as the product of designing

What if your paper is a product? – Designing your paper

- Your paper is a product like any other product.
- Your paper is an artifact that is the culmination of a process involving thinking and executing various activities aimed at
 - creating a document that will be published in a journal,
 - read by people, and
 - cited in other papers.
- We all know that the success rate of a well designed product is much more than one with a sloppy design and
- The initial stages of design are most critical to success
- Consequently, we need to design our papers the best we can and as early as possible!

Who is my audience?

My customers

- Don't try to sell your product to the wrong audience. They will simply ignore it.
- Find the best audience for your work. They are likely to appreciate it and it would be read by more people.
- It is true that searching for relevant papers in good databases will lead to most existing papers, but focused, deliberate search in particular journals could be more effective in many cases.
- Your audience is likely to look for your paper in the appropriate place they expect it to be. Therefore, find the journal that best fits your paper and try to target those considered among the best in the field.
- If you pick a journal in which you have not published before, be prepared to invest time in understanding the “culture” of the journal including the way they expect papers to be written, the right mix between theory and practice, the language, etc.

Who is my audience?

My customers

Examples of specific issues that could help finding good journals

- *How can you detect that you are looking in the **wrong** journal?*
 - Your paper does not refer to any reference from that journal
 - Recent issues of the journal do not contain papers with related topics
- *How can you detect a journal that suites your paper?*
 - There are a number of references in your bibliography from that journal
 - You are familiar with the work of some editorial board members and it is related to your paper
- *How can you make a suitable journal for your written paper to be even more appropriate?*
 - Scan the journal to find papers relevant to your paper and see whether they could be integrated in your state-of-the-art bibliography survey (see below). This increase the value of your paper to reader of that journal as they see how your work reinterprets previous work and builds on it.
 - Modify your paper to fit well in the scope of the journal including stating how your results support better understanding of issues of interest to the journal audience.

What is my audience looking for?

- If you choose a journal in which your peers publish, you have to know what interest the community you belong to.
- Questions that are important to develop as professionals and related to selecting research topics and writing papers include:
 - How do research trends impact papers topics and their publications?
 - How do we detect fundamental, long lasting issues, worth publishing?
 - How do we discover new promising directions?
 - How are research breakthroughs created?

My audience

The paper food chain

- Editor
 - Provide me a clear message, reasonable English, 3 reviewers (not friends, known almost best in field,)
- Reviewers
 - Write in easy to read and understand, clear message upfront cause do not have too much attention to spend on your paper
- Readers
 - Write a good paper that advances them
- Future promotion referees
 - Write excellent, well cited paper that makes a solid contribution to the field
- ...

How do I attract my audience to my paper when they can view many others on the same subject?

I pose this as a question and welcome ideas on this subject:

- It is an art
- It is just luck
- “Lobby” at conferences about your work
- Write a sequence of publications on the subject that accumulate to a sound critical mass
- Title: Clear, easy to digest important message, provocative title, ...
- Include a thorough critical review of the literature in the paper that might be a contribution in its own right
- ...

“What is the sale price”?

- How much material do I put in a single paper?
- Do I cut a subject or material into several papers to have more publications?
- Do I submit the paper in a mediocre journal to get it published?
- It seems that we are moving toward appreciating publishing complete quality contributions rather than many small incremental pieces

Guidelines



Checklist: Evaluating your paper before submission

- Is the paper about design? Fit with the **scope of RED**

Checklist: Evaluating your paper before submission

- Does the paper have a claim?
- A paper needs to claim something. A claim could be “the paper presents a method for doing X that is better than method Y, in Z aspects.”
- This example shows that the claim is composed of at least 3 parts:
 1. the statement of the claim, e.g., “the paper presents a method for doing X”
 2. the context or state-of-the-art in which the sentence is situated, e.g., “methods Y”
 3. the way to evaluate the sentence, e.g., “better in Z aspects.”
- **A paper without a worthwhile claim cannot be published.** Consequently, if the Editor-in-Chief or the Area Editor does not find such claim, the paper is rejected immediately.

Checklist: Evaluating your paper before submission

- Is the claim clear?
 - The paper claim should be very clear to readers, and in particular, to the reviewers.
 - The claim cannot be hidden in the description of the solution, nor in the conclusions;
 - **The abstract and introduction should spell the claim clearly.**

Checklist: Evaluating your paper before submission

- Does the **title, abstract, and introduction** reflect the content of the paper?
 - The title/abstract/introduction are not a tease or an advertisement to read a paper
 - They should be a clear and accurate description of what the paper is about, how does the paper achieves its goals and what are its limitations.
 - Ideally, by reading the **abstract, introduction and conclusions** sections, a reader should have enough information to decide whether to read the paper or not.

Checklist: Evaluating your paper before submission

- Is state-of-the-art reviewed well?
 - Are all relevant sources cited and critically analyzed?
 - It is insufficient to provide a “story-like” description of what some previous references include.
 - The review should attempt to put them in a single framework and discuss the limitations of previous approaches to allow claiming the present paper benefits.

Checklist: Evaluating your paper before submission

- Is the research method described well?
 - Research method is the method you are using to justify the claims of the paper.
 - It should be described and justified well.
 - For example,
 - if the paper is a survey, the way of selecting the references should be described, or
 - if the paper includes a statistical analysis of an experiment, the details of the statistical test should be justified.

Checklist: Evaluating your paper before submission

- Is the research method consistent with the research claim, in particular, with the stated evaluation method of the claim?
 - If a statement is made that a method improves practice, the research method cannot be an analytical proof but an empirical study showing improved practice.
 - The precise choice of the research method and its suitability to the subject matter should be defended in the paper.

Checklist: Evaluating your paper before submission

- If the paper focuses on a method/approach, is it described in sufficient detail so that readers can implement it?
 - One of the hallmarks of science is replicability.
 - While it may be impossible to replicate real design situations, it is still possible to describe studies in sufficient details so that they could be replicated.

Slide cancelled

because, if design is the essence, it needs to have its own way of evaluation. The following slide is an attempt to *design* such an evaluation.

Checklist: Evaluating your paper before submission

- If the paper focuses on a method/approach, is it described in sufficient detail so that readers can implement it on their particular problem?
 - One of the hallmarks of science is replicability, however, design does not occur in controlled environments and requires a different way of thinking and defining the value of a contribution and its rigor
 - While it may be impossible to replicate real design situations, it is still possible to describe studies in sufficient details so that a reader can extract valuable information in order to use in his/her own practice/research.
 - The information that transcends the particular study and could be used elsewhere becomes the contribution of the paper.

Checklist: Evaluating your paper before submission

- Is the evaluation convincing in allowing accepting the paper claim?
 - If a paper claims that a method helps design practice, it should demonstrate the method in design practice, not on a small toy problem solved by a student.
 - If the evaluation is on a small problem solved by a student, the claims should be changed accordingly.
 - One small or benchmark example hardly helps readers accept a paper claim. Such evaluation could be a mere chance.

Checklist: Evaluating your paper before submission

- Are the limitations of the approach listed clearly?
 - We have learned in science that no theory is permanent or true always and no method is best for all problems.
 - Consequently, each approach should be accompanied with its limitation and precise scope to allow using it when appropriate.

Checklist: Evaluating your paper before submission

- Are the limitations of the approach listed clearly? Are the conclusions valid?
 - Conclusions should relate to claimed made in the abstract or the introduction but not merely reiterate them;
 - the conclusions should reflect what was demonstrated through a proper evaluation.
 - If the abstract says that “an important design aspect is X” and describes research on X, the connection should be made back from X to design.
 - The paper need to show that its report on X have an impact on design.
 - If this is not the case, it should be stated as limitation of this study and analyzed carefully, stating what exactly has been achieved.
 - Such limitation better be mentioned in the introduction to prevent readers of getting the wrong impression when they start reading the paper.

Checklist: Evaluating your paper before submission

- Is the length of the paper appropriate?
 - Papers could be short or long but their length should reflect their content.
 - Short papers sometimes give the impression that they are proceedings papers submitted for journal publication.
 - Even if this is not the case, writing short papers that address all the issues in this checklist is difficult.
 - This does not mean we are looking for long papers but that we stress the “(paper value)/(paper length)” issue.

Checklist: Evaluating your paper before submission

- Are the figures adding value beyond the text?
 - Figures are effective way to convey information but expensive for publishing.
 - Therefore, their use must be done properly.
 - A figure must be introduced In the text with reference before it appears in the text.
 - It should be explained well so that it is understood and that its value adds something to a text without it.
 - Examples of ineffective figures are those showing the screen of a program to show that a program was developed or figures whose text is not in English and cannot be comprehended.

Checklist: Evaluating your paper before submission

- Has the paper appear in proceedings of a conference?
 - If the answer is yes, there should be significant change of the submission from the proceedings paper.



Checklist: Evaluating your paper before submission

- Are quotations done properly?

Checklist: Evaluating your paper before submission

- Which reference to include?
 - Quality and availability drive the kind of reference to cite.
 - Cite journal papers before refereed proceedings
 - Cite English references before other languages.
 - Cite the first paper that made the contribution you wish to rely upon
 - Do not use references to support obvious statements

What should you do when your paper requires revision?

- Hardly any paper passes the initial review and accepted as is.
- Otherwise, the paper needs some revision, minor or major, before it is further considered for publication.
- The classification to minor or major revision has no influence on the subsequent process. A revised paper might undergo a complete review by 3 reviewers or be examined only by the editor. The particular way in which the revised paper would be handled rests with the editor-in-chief and the area editor.
- The authors have the greatest influence on the outcome of the 2nd review process.
 - They must address each reviewer comment.
 - This requires understanding the comment, deciding whether they agree with it or not, revising the paper and detailing how and where the revision took place or write a rebuttal.
 - The list of responses to reviewers' comments needs to accompany the revised paper.
 - We require that the revision be made with red font to facilitate easy review.
- Authors must not underestimate the precision in which they have to address each reviewer comment.
 - They should remember that reviewers volunteer to spend time reading their paper and providing their best judgment about what is needed to publish the paper.
 - Reviewers like to see their work appreciated and given full attention.
 - Therefore, comments that are not addressed could easily undermine the goal of the authors to publish their paper.