Writing Perfect Papers

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A long talk today on writing perfect papers

“Perfect papers” don’t exist

But let’s try our best

And try to write good papers quickly

1

Writing perfect papers

2

Writing good papers fast!

Our goal today: improve both the skills 1
and the process 2

1

Writing perfect papers

A top-down approach: from the big picture to tiny details

1

Writing perfect papers

I am going to talk about four things

1.1

The story

Writing perfect papers

1.2

The work

Writing perfect papers

1.3

The art

Writing perfect papers

1.4

The details

Writing perfect papers

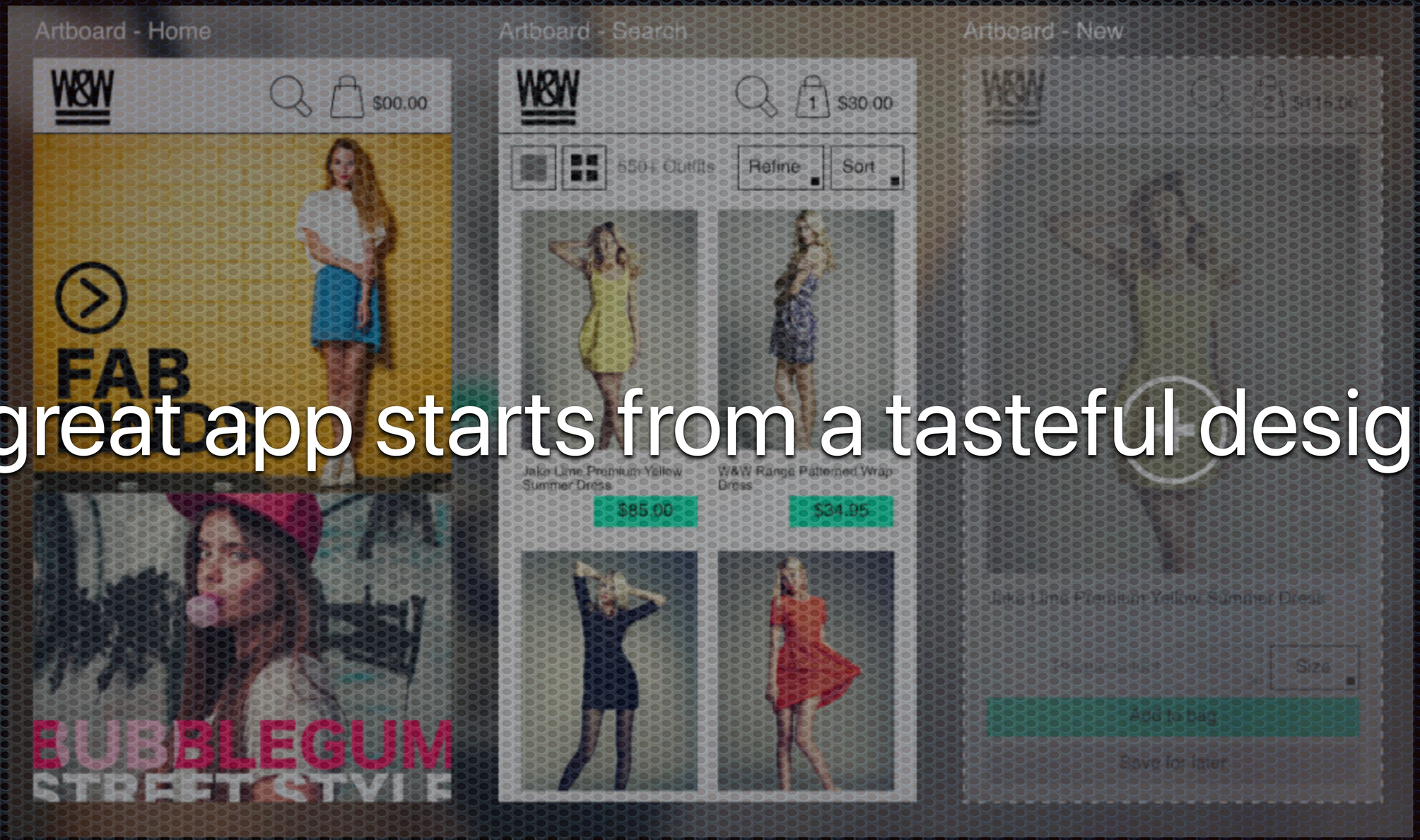
1.1

The story

Writing perfect papers

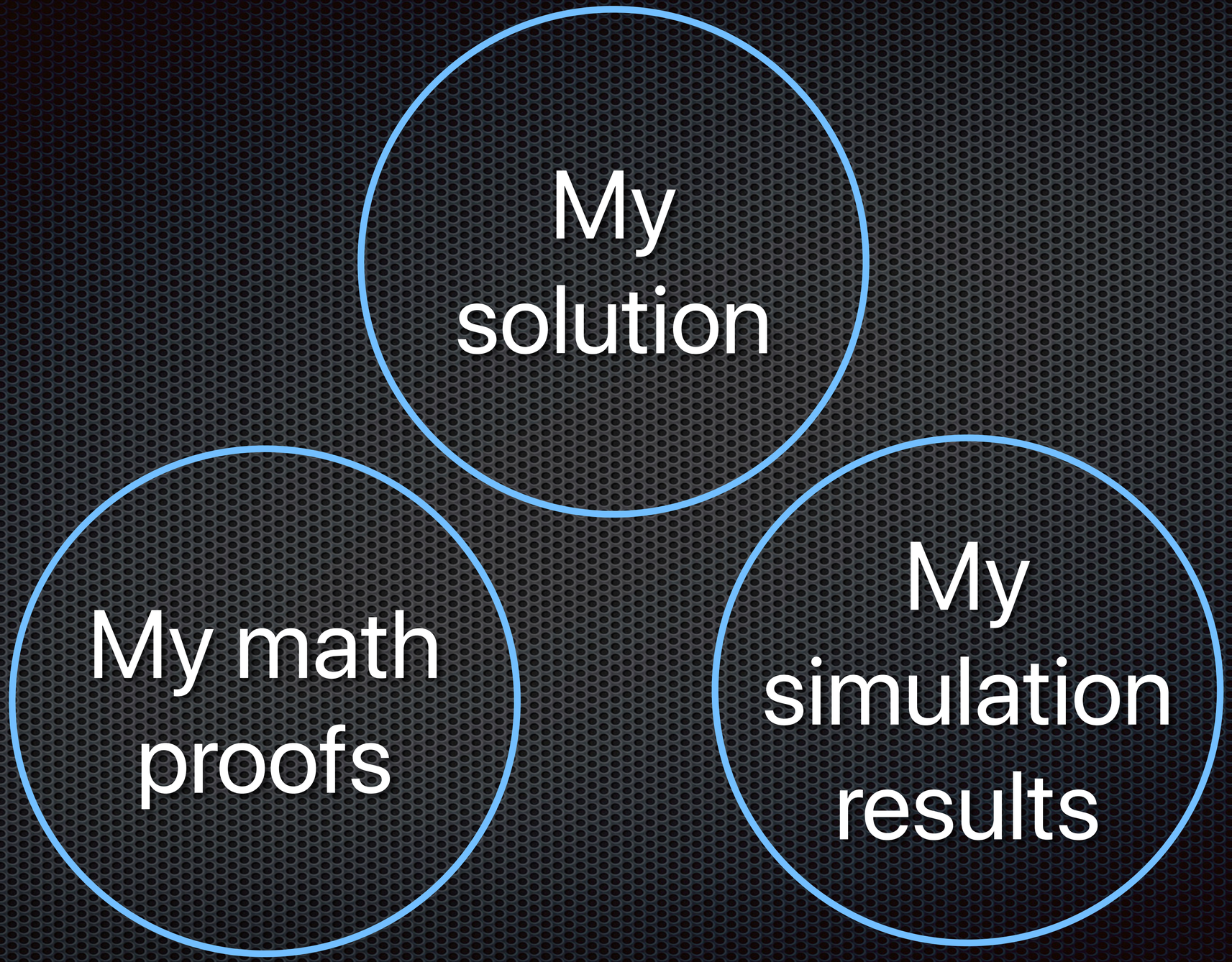
How do I make a great movie?

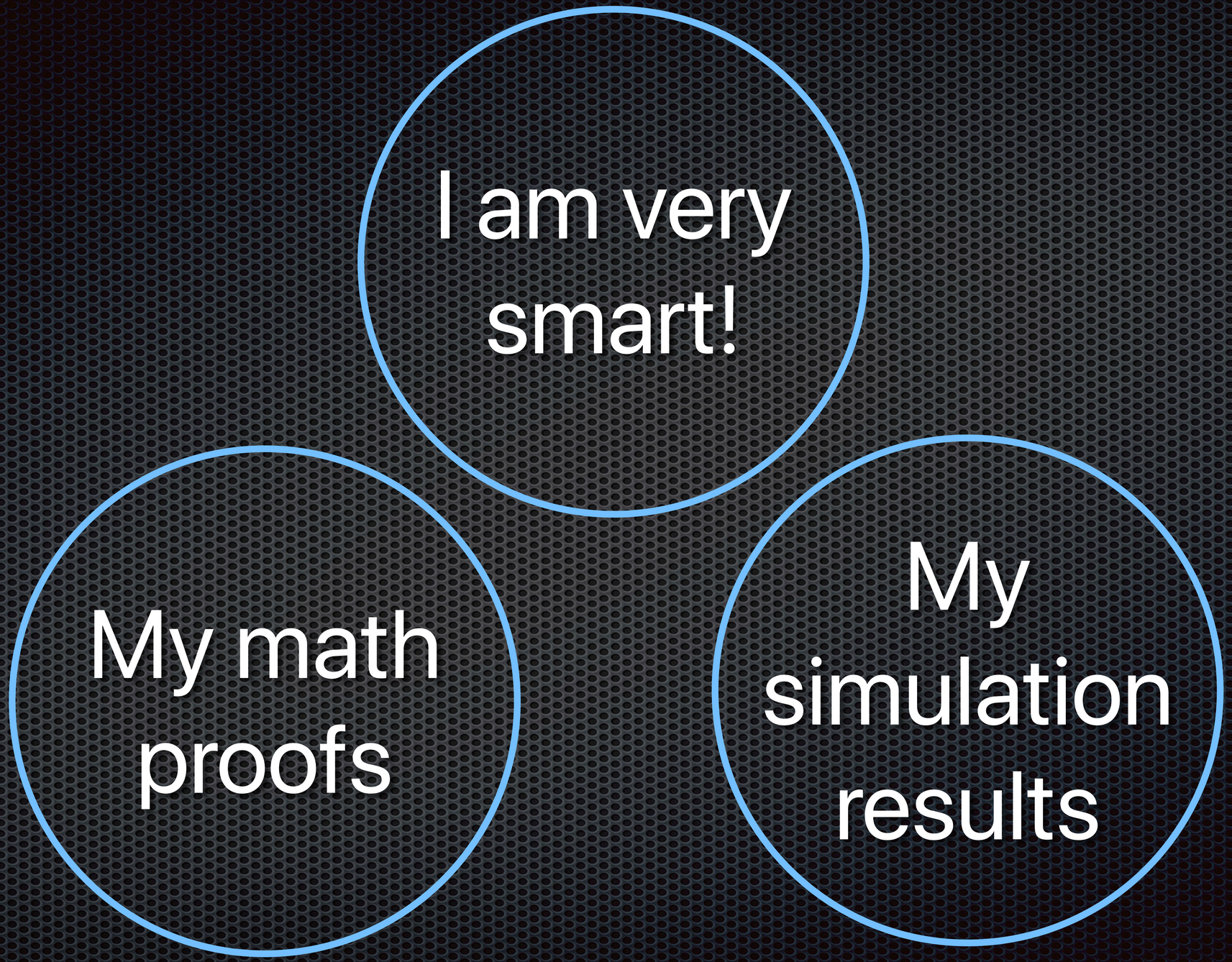
A great movie starts from a powerful and convincing story

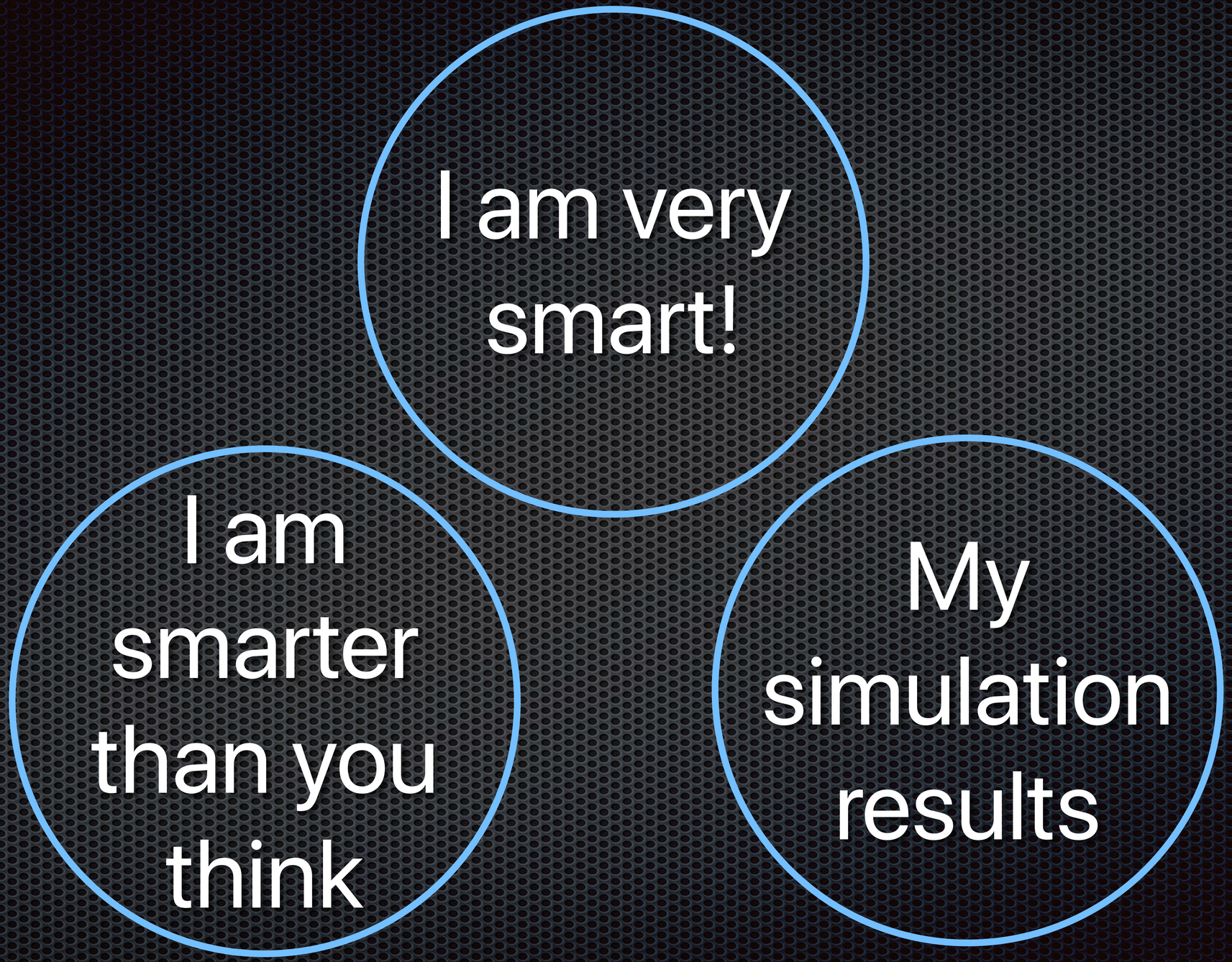


A great app starts from a tasteful design

Three essential elements of a great story


My solution
My math proofs
My simulation results

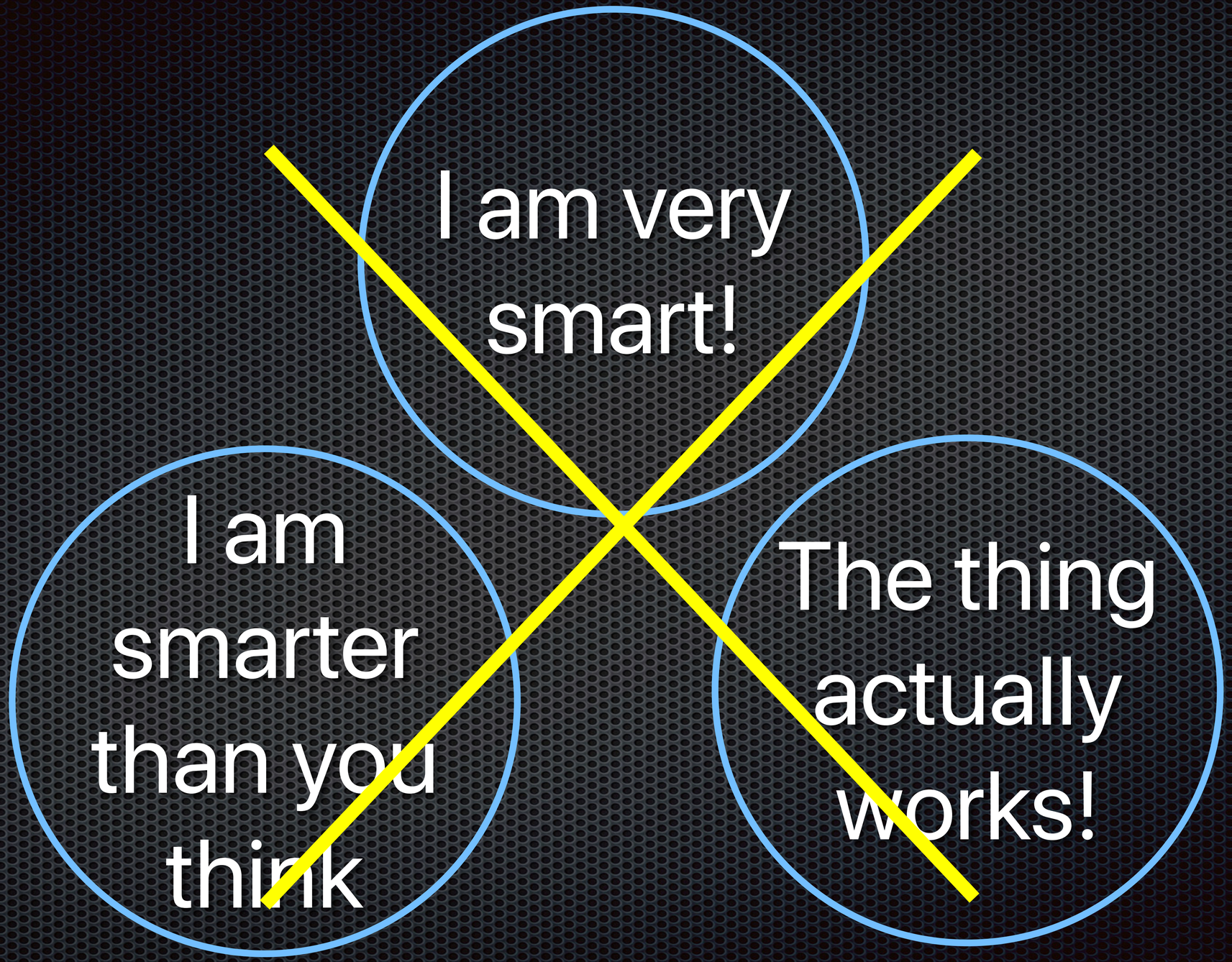

I am very smart!
My math proofs
My simulation results


I am very smart!
I am smarter than you think
My simulation results

I am very smart!

I am smarter than you think

The thing actually works!


I am very smart!
I am smarter than you think
The thing actually works!

Your paper is not really the best place to show your theoretical prowess

It’s about advancing the state-of-the-art

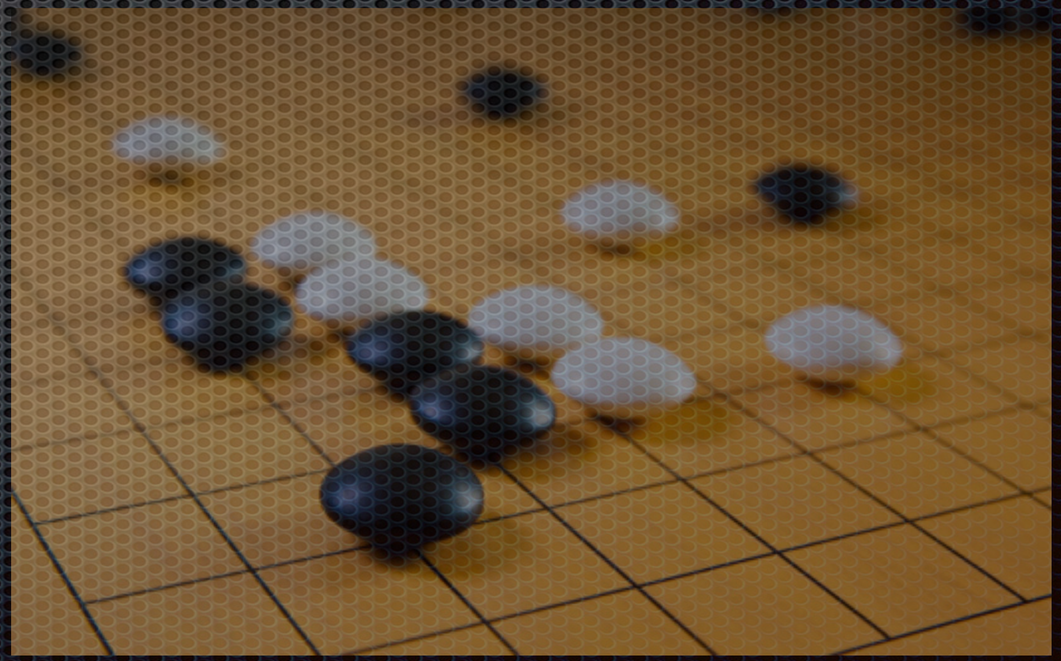
The problem

What's new?

How is it better?

The problem

Doesn’t have to be something “trendy”

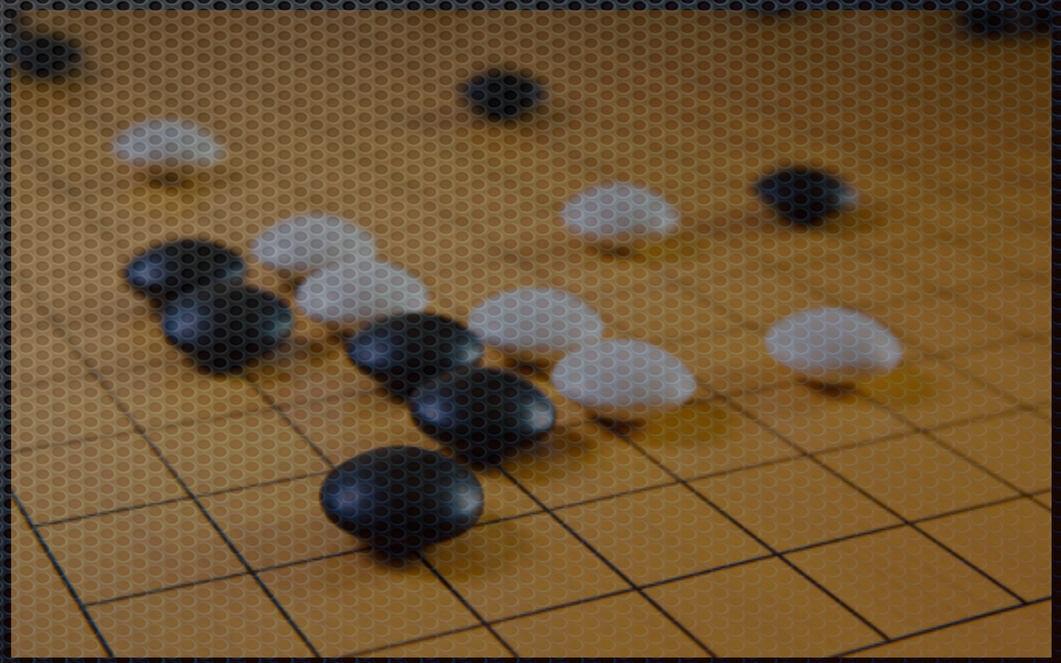


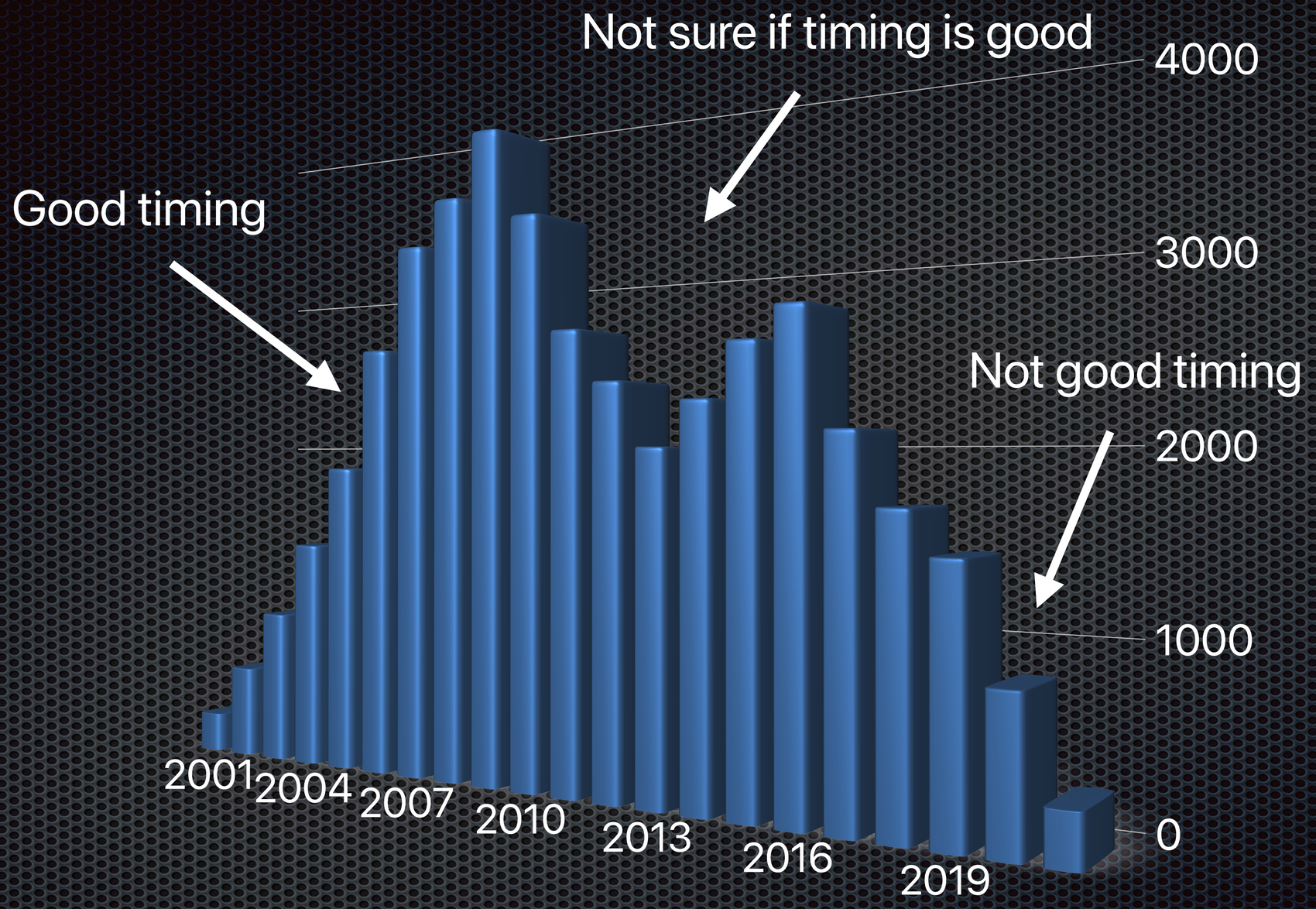
The problem

But it has to be something you really enjoy working on

The problem

The "trend" may not last forever





Google Scholar search: “P2P” in the paper title

Following the trend may lead to more "incremental" results — less exciting and less important

Be a contrarian and work against the trend

In fact, a recent 2017 paper, titled "BBR: Congestion-based Congestion Control," brought congestion control in the general case back to the spotlight

So, be a contrarian and working against the trend may be a good idea

What's
new

In the context of what's already done in the related work, what's new in your work?

First, briefly introduce the state-of-the-art in the literature, solving the same problem you wish to solve

Then write about what is new in your work that is different from previous work

If the problem is different from previous work — different assumptions, for example — provide justifications why this is important and necessary

How is it better?

Now that your ideas are new, they should also lead to better results than before

Show how your solution is better than previous work: such as stronger theoretical properties or better experimental results

The problem

What's new?

How is it better?

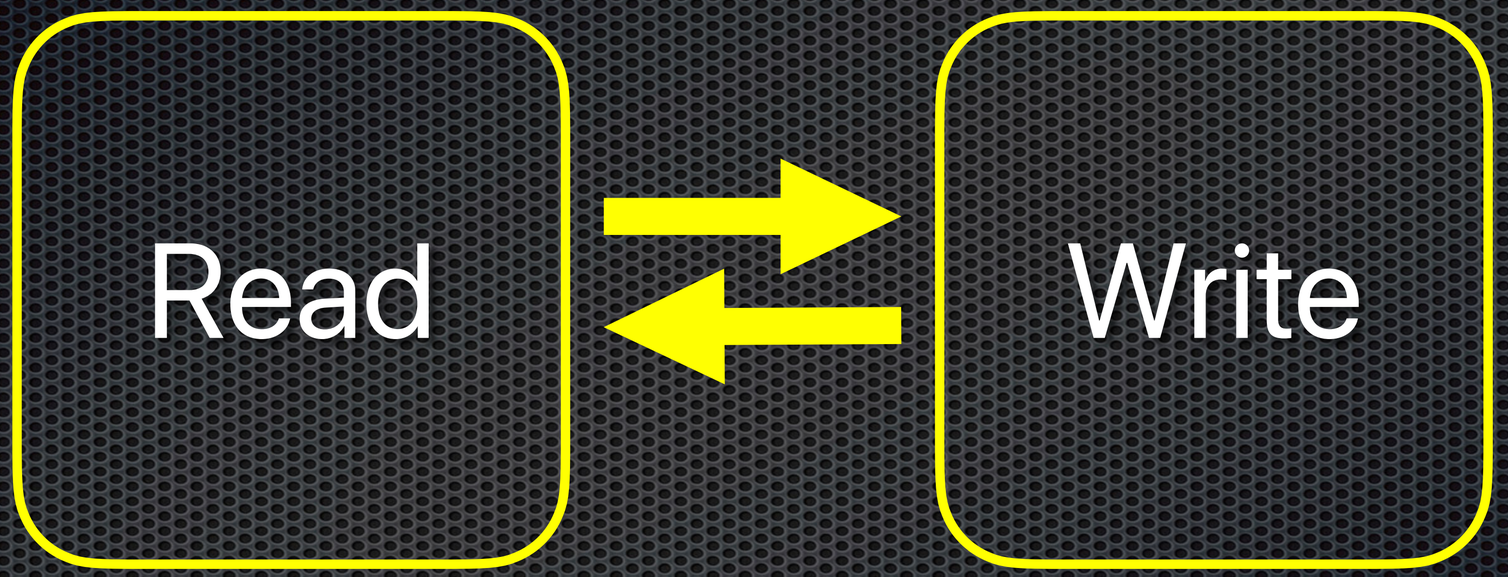
Three essential elements

1.2

The work

Writing perfect papers

Two things that you must do


Read
Write

Read

Goal: become an expert on the problem

Read But how?

Read

Start from one paper

Read

Perhaps a highly cited seminal paper

Read

Then do an expanded-ring search

Read

Papers that cited this paper

Read Papers that it cited

Read

Papers authored by the same researchers

Read

Try not to depend only on a search engine

Read

Read quickly first

Read

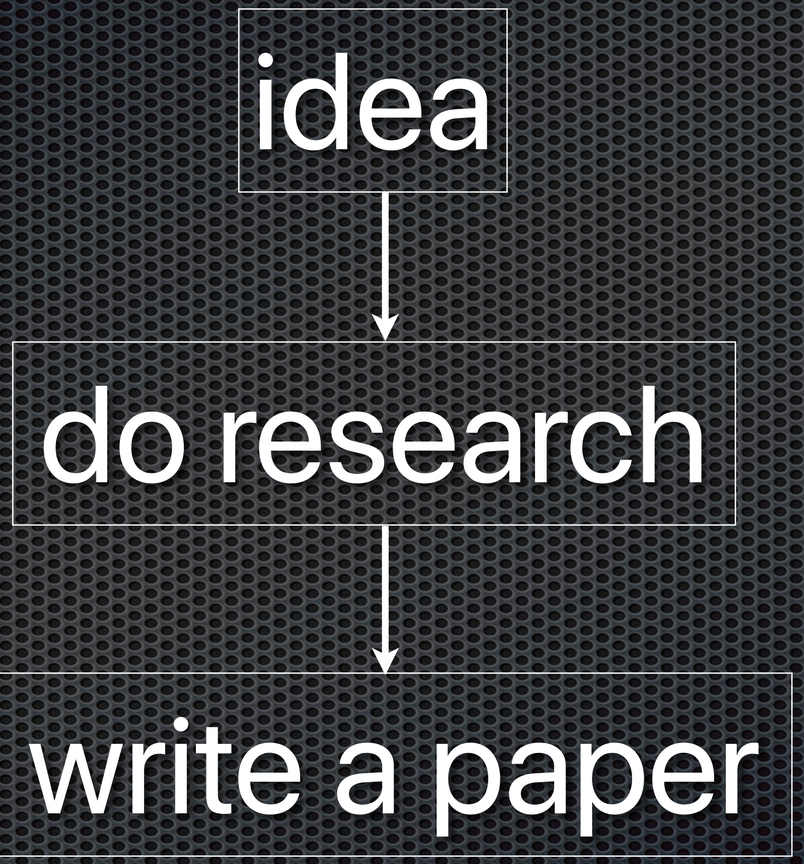
Read more carefully if necessary later

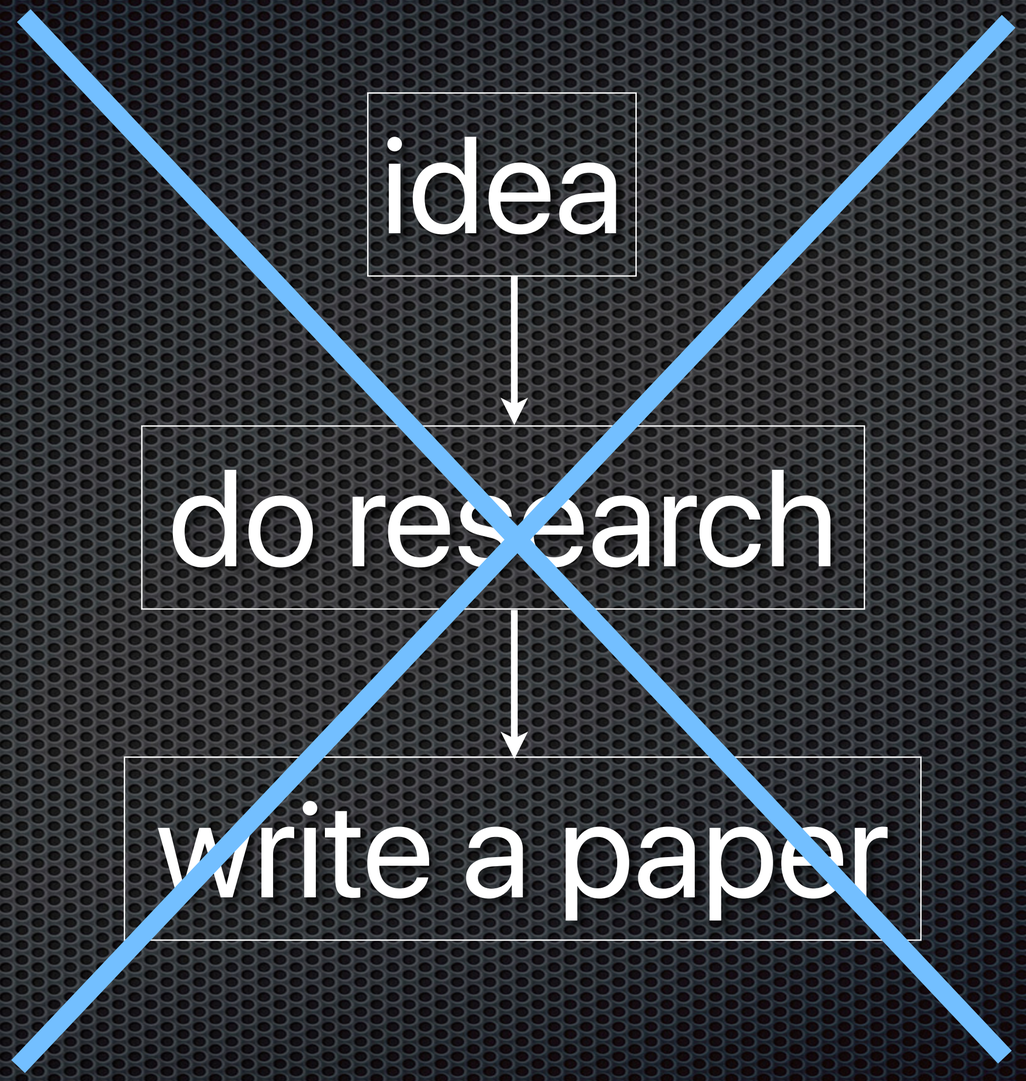
Write about what you understood

Write

Write every day

Write


idea
do research
write a paper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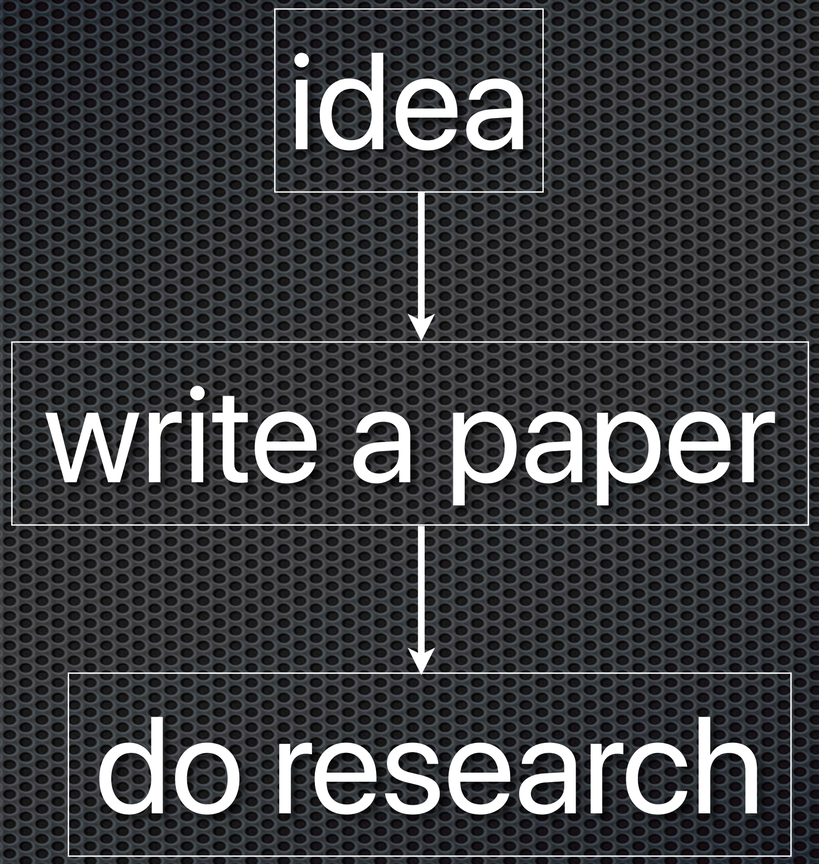

idea
write a paper
do research

If I don’t have an idea,
what do I write about?

Write

You write anyway

Write

Write about related work

Write

Write about what’s challenging

Write

Write about why the problem is important

Write

Write about what needs to be fixed

Write

Write a survey paper

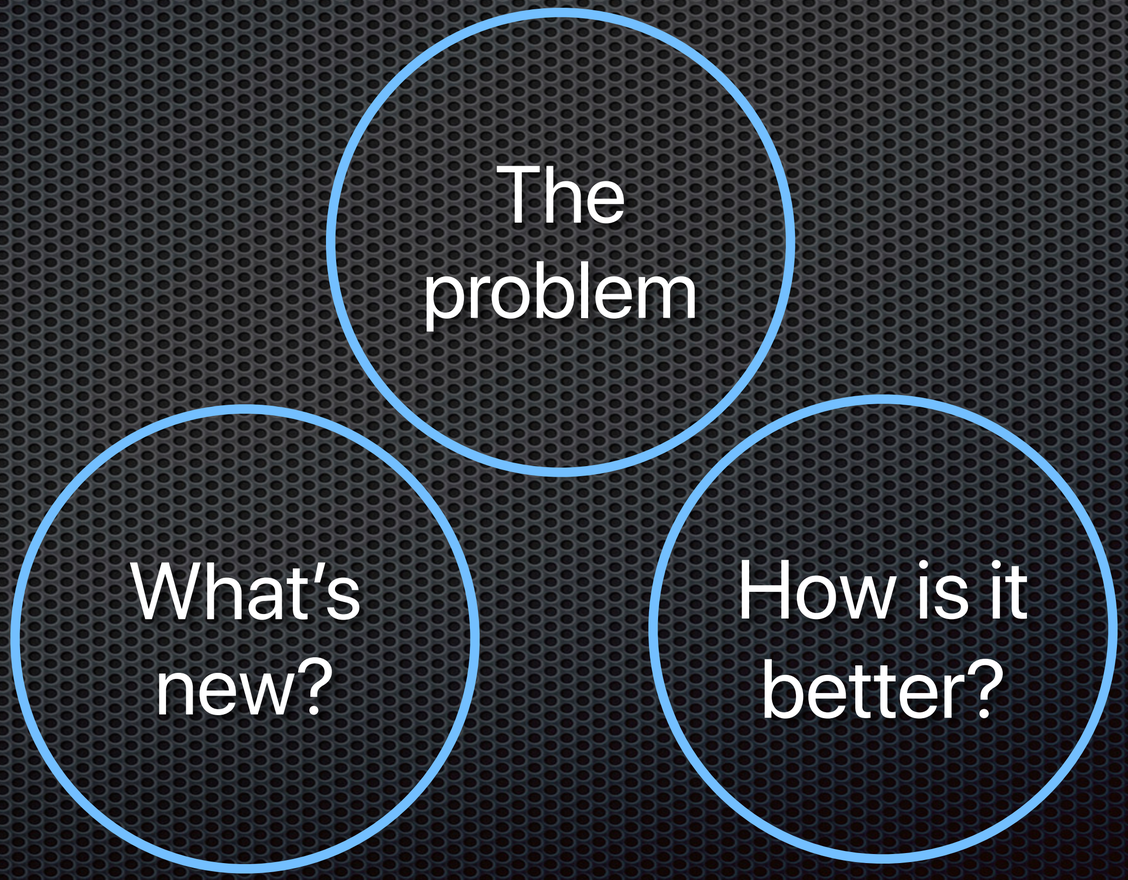
Write

Submit your survey paper for publication

Write

Write about what's new in the context of related work

Write



Creating ideas interacts with writing closely

Write

Writing is the best way to force yourself to think clearly and be focused

Write

and to crystallize what you don’t quite understand yet

Write

Writing also opens
a dialogue

Write

For others to read what you wrote

Write

To stimulate
discussions with others

Write

That’s why writing is a slow and painful process

Write

Write in a crystal clear way

Write

Write about one problem and one (potential) solution

Write

Write with a flow of ideas that's easy to follow

Write

Keep your readers engaged throughout the paper

Write

Write your paper so that it's as easy to understand as absolutely possible

Write

Your readers don’t have to work hard

Write

Write your paper slowly, so that your readers can read quickly

Write

1.3

The art

Writing perfect papers

Pay attention to the title, abstract, introduction, and flow of ideas

Title: 2 lines, 10,000 readers

Abstract: 10 lines, 1,000 readers

Introduction: 100 lines, 100 readers

The rest of the paper:

1,000 lines, 10 readers

A

The title

Writing perfect papers: the art

What’s a good title?

It attracts a reader to read the abstract

It reflects the essence of the new idea

It is as simple as possible

- does not have to be a precise summary of the paper
- does not need to include all the keywords

The best title is one that is the easiest to understand at a glance

Let’s say we have a new idea that uses a new coding technique to reduce the latency when delivering data over the Internet

Which title is the best?

LLRC: A Low-Latency Rate-Controlled System for Fast Data Delivery over the Internet

Coded Information Distribution: New Content-Delivery Protocols for the Internet

Coding Reduces Latency over the Internet

Which title is the best?

LLRC: A Low-Latency Rate-Controlled System for Fast Data Delivery over the Internet

Coded Information Distribution: New Content-Delivery Protocols for the Internet

Coding Reduces Latency over the Internet

S. U. Stich. "Local SGD Converges Fast and Communicates Little," Int'l Conference on Learning Representations (ICLR) 2019.

Here’s another new paper on the wireless spectrum market, where buyers and sellers are matched in a nicely optimized fashion

Which title is the best?

Extended Deferred Acceptance: Interference-Free Matching between Spectrum Buyers and Sellers

Stable Matching for Wireless Spectrum Markets

Spectrum Matching

Which title is the best?

Extended Deferred Acceptance: Interference-Free Matching between Spectrum Buyers and Sellers

Stable Matching for Wireless Spectrum Markets

Spectrum Matching

I have a co-authored paper in 2016 titled "Spectrum Matching" — so though it's a bit risky, it can work out

B

The abstract

Writing perfect papers: the art

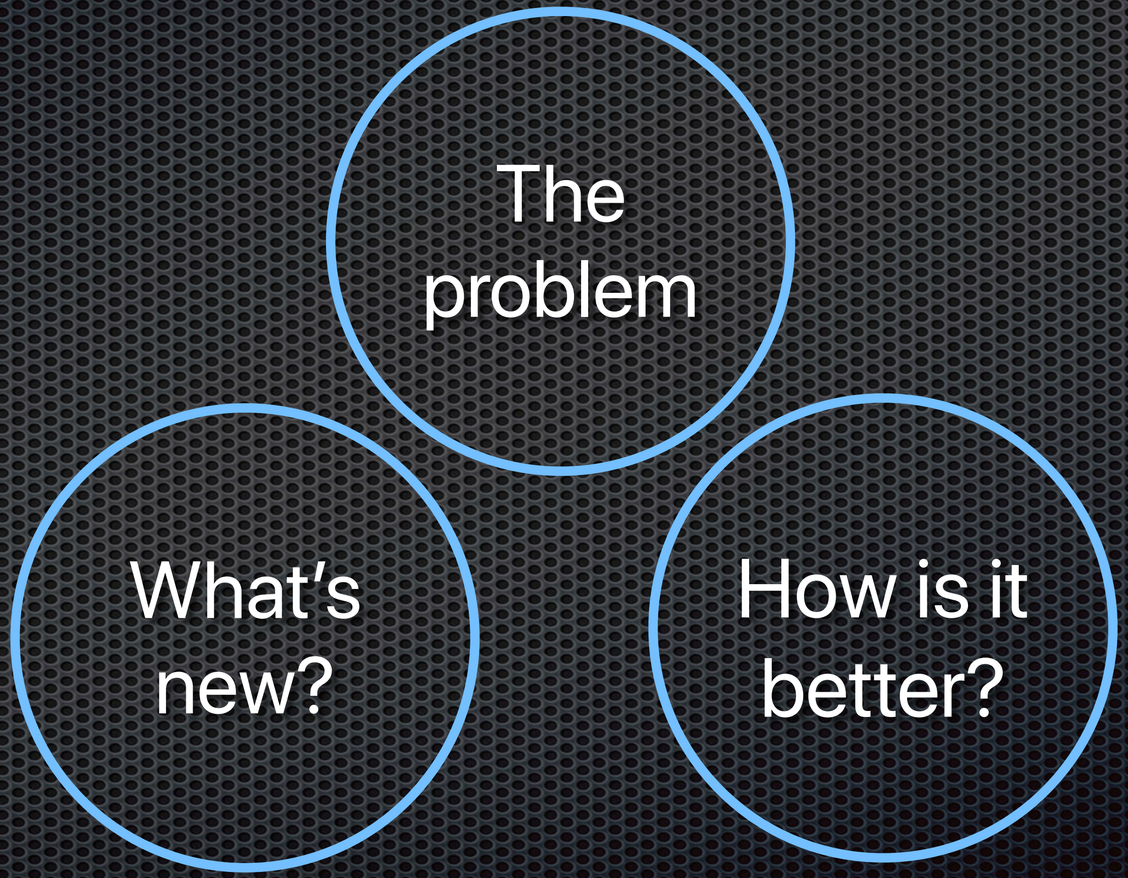
The abstract

The abstract is a very important tool to attract readers to read the introduction

Again, it conveys essential information about the paper

It should be concise, and does not need to be long

Remember the three essential elements



A typical structure

One sentence to state the background

One sentence to state what the problem is

Two to four sentences to state the original contributions in the paper — what's new?

One sentence to state how the solution is better, validated using analyses, simulations, or experiments

Here is an abstract from one of my co-authored papers

We will use this as our running example throughout this talk

It’s title: “Oruta: Privacy-Preserving Public Auditing for Shared Data in the Cloud”

It currently has the highest number of citations in all the papers I co-authored

So let’s take a look at how it’s written

Background

With cloud storage services, it is commonplace for data to be not only stored in the cloud, but also shared across multiple users. However, public auditing for such shared data — while preserving both data and identity privacy — remains to be an open challenge.

Problem

With cloud storage services, it is commonplace for data to be not only stored in the cloud, but also shared across multiple users. However, public auditing for such shared data — while preserving both data and identity privacy — remains to be an open challenge.

Contribution: Overview

In this paper, we propose the first privacy-preserving mechanism that allows public auditing on shared data stored in the cloud. In particular, we exploit ring signatures to compute the metadata needed to verify the integrity of shared data. With our mechanism, the identity of the signer of each data block is kept private from a third party auditor (TPA), who is still able to publicly verify the integrity of shared data without retrieving the entire file. In addition, we utilize homomorphic MACs and homomorphic hash functions to mitigate the overhead of storing our signatures.

Contribution: Highlights

In this paper, we propose the first privacy-preserving mechanism that allows public auditing on shared data stored in the cloud. In particular, we exploit ring signatures to compute the metadata needed to verify the integrity of shared data. With our mechanism, the identity of the signer of each data block is kept private from a third party auditor (TPA), who is still able to publicly verify the integrity of shared data without retrieving the entire file. In addition, we utilize homomorphic MACs and homomorphic hash functions to mitigate the overhead of storing our signatures.

Contribution: Highlights

In this paper, we propose the first privacy-preserving mechanism that allows public auditing on shared data stored in the cloud. In particular, we exploit ring signatures to compute the metadata needed to verify the integrity of shared data. With our mechanism, the identity of the signer of each data block is kept private from a third party auditor (TPA), who is still able to publicly verify the integrity of shared data without retrieving the entire file. In addition, we utilize homomorphic MACs and homomorphic hash functions to mitigate the overhead of storing our signatures.

Contribution: Additional features

In this paper, we propose the first privacy-preserving mechanism that allows public auditing on shared data stored in the cloud. In particular, we exploit ring signatures to compute the metadata needed to verify the integrity of shared data. With our mechanism, the identity of the signer of each data block is kept private from a third party auditor (TPA), who is still able to publicly verify the integrity of shared data without retrieving the entire file. In addition, we utilize homomorphic MACs and homomorphic hash functions to mitigate the overhead of storing our signatures.

Validation by experiments

Our experimental results demonstrate the effectiveness and efficiency of our proposed mechanism when auditing shared data.

C

The introduction

Writing perfect papers: the art

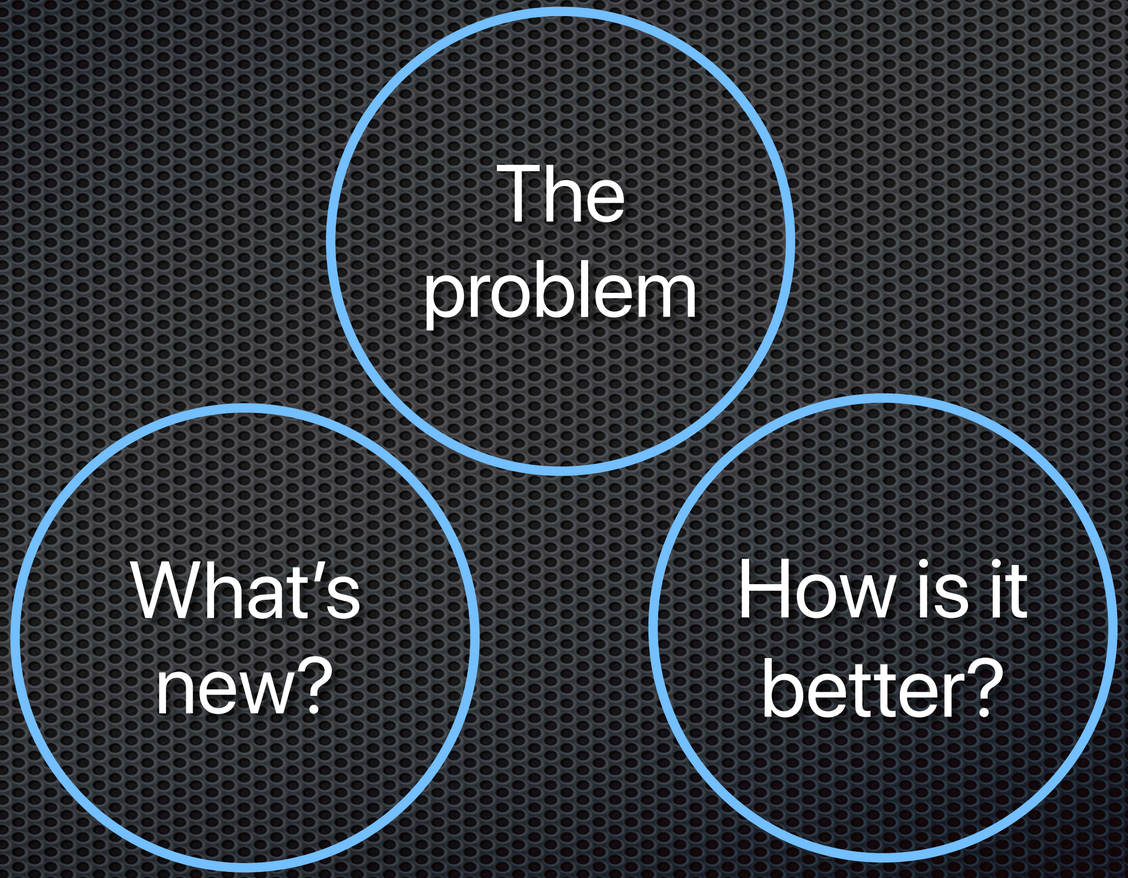
If your title and abstract can get a reader to read the introduction, you are half way there

The remaining job: impress the reader with an exciting and clear introduction

The introduction is so important that I rewrote the introduction in many of my papers

It is important because we wish our readers to understand our ideas, even if they only read the introduction and nothing else

Remember the three essential elements



Writing a good introduction

It should be self-contained, so that a reader short on time doesn't need to read the rest of the paper

It should be clear what the problem is

It should be easy to understand why our solution is new, and how it's better than previous work

Writing a good introduction

Don’t make it too long

Don’t spend too much space on the background and related work

- There can be a separate “Related Work” section

Don’t make your work sound more original than it really is

Introduction: a typical structure

First (opening) paragraph

A general overview of the research field — basic facts needed to “warm up” the reader and to prepare for the problem statement

Not too long — 2-3 sentences are good enough

For our auditing paper, here is the first paragraph that the student author at the time wrote —

Overview: First draft

Nowadays, data storage and sharing is one of the most popular service in cloud computing. For instance, a group of user can share and edit the same document simultaneously using Google Apps. Although the cloud can provide more reliable services than personal devices, the integrity of the cloud data still faces challenging security threats [1]. Due to human errors, device failures or internal/external attacks, the outsourced data on the cloud may easily lost or corrupted [1]. Another threat for the integrity of the cloud data is that the cloud service provider may delete rarely used data without informing users to save the storage space and reduce the commercial cost on those data [1].

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Now let’s find out all the problems in this paragraph together

This paragraph is simply too long — the author is asking the reader to "decipher" it

The first two sentences tried to warm-up the reader with an overview

And the last three sentences actually tried to describe the problem — the problem statement

In this case, they should be separated into two paragraphs

The second paragraph: problem statement

A clear description of the challenges to be addressed and the problems to be solved

Appeal to the intuition of the reader

Describe at a high level

It is fine (and even a good idea) to include an intuitive solution to the problem

Getting back to our example

Overview: Second draft

Nowadays, data storage and sharing is one of the most popular service in cloud computing. For instance, a group of user can share and edit the same document simultaneously using Google Apps.

Although the cloud can provide more reliable services than personal devices, the integrity of the cloud data still faces challenging security threats [1]. Due to human errors, device failures or internal/external attacks, the outsourced data on the cloud may easily lost or corrupted [1]. Another threat for the integrity of the cloud data is that the cloud service provider may delete rarely used data without informing users to save the storage space and reduce the commercial cost on those data [1].

The two paragraphs are not balanced in length

And the second paragraph is pretty hard to understand

Let’s first take a look at the first paragraph to see if we can improve it further

Overview: Second draft

Nowadays, data storage and sharing is one of the most popular service in cloud computing. For instance, a group of user can share and edit the same document simultaneously using Google Apps.

Overview: Second draft

Nowadays, data storage and sharing is one of the most popular service in cloud computing. For instance, a group of user can share and edit the same document simultaneously using Google Apps.

Grammatical mistakes

Overview: Second draft

Nowadays, data storage and sharing is one of the most popular service in cloud computing. For instance, a group of user can share and edit the same document simultaneously using Google Apps.

What's "cloud computing?" Not perfectly self-contained

Overview: Second draft

Nowadays, data storage and sharing is one of the most popular service in cloud computing. For instance, a group of user can share and edit the same document simultaneously using Google Apps.

Poor transition: “for instance” with respect to what?

Now let me show you the first paragraph I wrote

Overview: Second draft

Cloud service providers manage an enterprise-class infrastructure that offers a scalable, secure, and reliable environment for users, at a much lower marginal cost due to the sharing nature of resources.

It is routine for users to use cloud storage services to share data with others in a team, as data sharing becomes a standard feature in most cloud storage offerings, including Dropbox and Google Docs.

First, "warm-up" to cloud computing

Overview: Second draft

Cloud service providers manage an enterprise-class infrastructure that offers a scalable, secure, and reliable environment for users, at a much lower marginal cost due to the sharing nature of resources. It is routine for users to use cloud storage services to share data with others in a team, as data sharing becomes a standard feature in most cloud storage offerings, including Dropbox and Google Docs.

At the same time, "warm-up" to the idea of sharing

Overview: Second draft

Cloud service providers manage an enterprise-class infrastructure that offers a scalable, secure, and reliable environment for users, at a much lower marginal cost due to the sharing nature of resources. It is routine for users to use cloud storage services to share data with others in a team, as data sharing becomes a standard feature in most cloud storage offerings, including Dropbox and Google Docs.

Formally introduce the idea of "sharing data"

Now let’s take a look at the next two paragraphs that the student wrote (after detaching the original first paragraph)

Problem statement: First draft

Although the cloud can provide more reliable services than personal devices, the integrity of the cloud data still faces challenging security threats [1]. Due to human errors, device failures or internal/external attacks, the outsourced data on the cloud may easily lost or corrupted [1]. Another threat for the integrity of the cloud data is that the cloud service provider may delete rarely used data without informing users to save the storage space and reduce the commercial cost on those data [1].

Second paragraph

Problem statement: First draft

To protect the integrity of the cloud data, an efficient method is to enable public auditing by introducing a third party auditor (TPA). This public auditor should have more powerful computation and communication abilities than regular users and is able to offer security services to cloud users [1].

First part of the third paragraph

Observation: both are somewhat related to the challenges of storing data in the cloud

The intuitive idea is that data stored in the cloud may be lost or corrupted, and the users don’t know

So a third-party auditor can be used to check the integrity of data on behalf of the users

But what the student wrote is asking a reader to do the hard work to "decipher" the writing and get the idea

The problem with his writing was that he tried to mix the basic idea with unnecessary details

Problem statement: First draft

Although the cloud can provide more reliable services than personal devices, the integrity of the cloud data still faces challenging security threats [1]. Due to human errors, device failures or internal/external attacks, the outsourced data on the cloud may easily lost or corrupted [1]. Another threat for the integrity of the cloud data is that the cloud service provider may delete rarely used data without informing users to save the storage space and reduce the commercial cost on those data [1].

Redundant sentence

Problem statement: First draft

Although the cloud can provide more reliable services than personal devices, the integrity of the cloud data still faces challenging security threats [1]. Due to human errors, device failures or internal/external attacks, the outsourced data on the cloud may easily lost or corrupted [1]. Another threat for the integrity of the cloud data is that the cloud service provider may delete rarely used data without informing users to save the storage space and reduce the commercial cost on those data [1].

Three citations to the same paper in the same paragraph

Problem statement: First draft

Although the cloud can provide more reliable services than personal devices, the integrity of the cloud data still faces challenging security threats [1]. Due to human errors, device failures or internal/external attacks, the outsourced data on the cloud may easily lost or corrupted [1]. Another threat for the integrity of the cloud data is that the cloud service provider may delete rarely used data without informing users to save the storage space and reduce the commercial cost on those data [1].

Unnecessary details

Why can’t we just describe the basic idea of the problem and its existing solution intuitively — and remove all the details that make it harder to read?

Unnecessary details inhibit the natural and brisk flow of the main ideas

Now let me show you the second paragraph I wrote

Problem statement: Second draft

The integrity of data in cloud storage, however, is subject to skepticism and scrutiny, as data stored in an untrusted cloud can easily be lost or corrupted, due to hardware failures and human error [1]. To protect the integrity of cloud data, it is best to perform public auditing by introducing a third party auditor (TPA), who offers its auditing service with more powerful computation and communication abilities than regular users.

Highlighting the problem:“the integrity of data”

Problem statement: Second draft

The integrity of data in cloud storage, however, is subject to skepticism and scrutiny, as data stored in an untrusted cloud can easily be lost or corrupted, due to hardware failures and human error [1]. To protect the integrity of cloud data, it is best to perform public auditing by introducing a third party auditor (TPA), who offers its auditing service with more powerful computation and communication abilities than regular users.

Mentioning two of the several reasons of lost data

Problem statement: Second draft

The integrity of data in cloud storage, however, is subject to skepticism and scrutiny, as data stored in an untrusted cloud can easily be lost or corrupted, due to hardware failures and human error [1]. To protect the integrity of cloud data, it is best to perform public auditing by introducing a third party auditor (TPA), who offers its auditing service with more powerful computation and communication abilities than regular users.

Smooth transition to a typical solution: "TPA"

Now let’s see the new 1st and 2nd paragraphs in the second draft

Now, the two paragraphs are about the same length

Cloud service providers manage an enterprise-class infrastructure that offers a scalable, secure, and reliable environment for users, at a much lower marginal cost due to the sharing nature of resources. It is routine for users to use cloud storage services to share data with others in a team, as data sharing becomes a standard feature in most cloud storage offerings, including Dropbox and Google Docs.

The integrity of data in cloud storage, however, is subject to skepticism and scrutiny, as data stored in an untrusted cloud can easily be lost or corrupted, due to hardware failures and human error [1]. To protect the integrity of cloud data, it is best to perform public auditing by introducing a third party auditor (TPA), who offers its auditing service with more powerful computation and communication abilities than regular users.

You may say, oh this is hard!

But remember, we only went through the first two paragraphs in the introduction

The gap between mediocre and excellent writing: only a few words here and there

Returning to the typical structure of the introduction

General overview to warm-up the reader (the opening paragraph)

State the problem (challenge) and existing solutions (1-2 paragraphs)

Limitations of existing solutions that motivate this paper (2-3 paragraphs)

Proposed solution: main idea (1-2 paragraphs)

Now it’s time to write about what’s new

What are the original highlights of the proposed solution? (1-2 paragraphs)

- Why is the proposed solution different from and better than existing solutions?
- State 1-2 most impressive highlights, not all of them
- Make the originality of the paper crystal clear and stand out
- You may use the sentence: “Highlights of our original contributions in this paper are as follows. First, … Second, … Finally, …”

The list of original contributions drives the entire paper — the rest of the paper substantiates the claims you have made

Your readers may think: “Hey, if they can really deliver this, that’ll be very exciting! I’d better read the rest of the paper.”

It is a good idea to include a table to compare important properties of the proposed solution with its “direct competitors” in the existing literature, highlighting your advantages

Show a table

It is a good idea to include a table to compare important properties of the proposed solution with its “direct competitors” in the existing literature, highlighting your advantages

Use an example

It’s an even better idea to show an intuitive example

Use an example

Your example shows how your main idea works in a special case

Use more examples

Continue with more examples throughout the paper

Use more examples

After each theorem is proved — or each algorithm shown — explain their implications or intuition with an example

Use more examples

Your examples need to be really simple

Use more examples

Your examples need to be really simple

Use more examples

They help readers to understand your solution well

Use well-designed figures

It'll be a great idea to include a well-designed figure to illustrate your example

Use well-designed figures

Include as many figures as you can throughout the paper

D

The flow of ideas

Writing perfect papers: the art

Just like the storyboard when making a movie, the flow of ideas needs to be carefully designed

Make sure that each paragraph contains one complete idea — split a paragraph that contains more than one idea, and merge short paragraphs that cover the same idea

Flow of ideas

Where is the section on related work?

Flow of ideas

Some prefer to place it after the introduction

Rationale: the section can be used to "warm up" the reader

Some others prefer to place it before the conclusion

Rationale: After the introduction, the readers don't understand your main ideas yet, there's no point in talking about their differences from related work

It depends on the design of your flow of ideas

Flow of ideas

Where do you write about experimental results?

Most papers collect all the experimental results and put them at the end

But you don’t have to

Some negative or preliminary experimental results may be important for motivating the main idea in the paper

Your flow of ideas can then be: “initial results — idea to improve — more results to show better performance”

You can even interleave experimental results with descriptions of your idea, if this provides the best flow

Flow of ideas

How do you allocate space across sections?

The short answer is: no one knows it better than you, because it depends on the flow of ideas

General rules of thumb

Don’t write a very long abstract (200 words), introduction (one page), related work (half a page), or concluding remarks (1-2 paragraphs)

Throughout the paper, make it self-contained, but don’t use a lot of space for unnecessary background

Keep the motivation short and concise

1.3

The art

Writing perfect papers

1.4

The details

Writing perfect papers

A

Use a git repository to manage your workflow

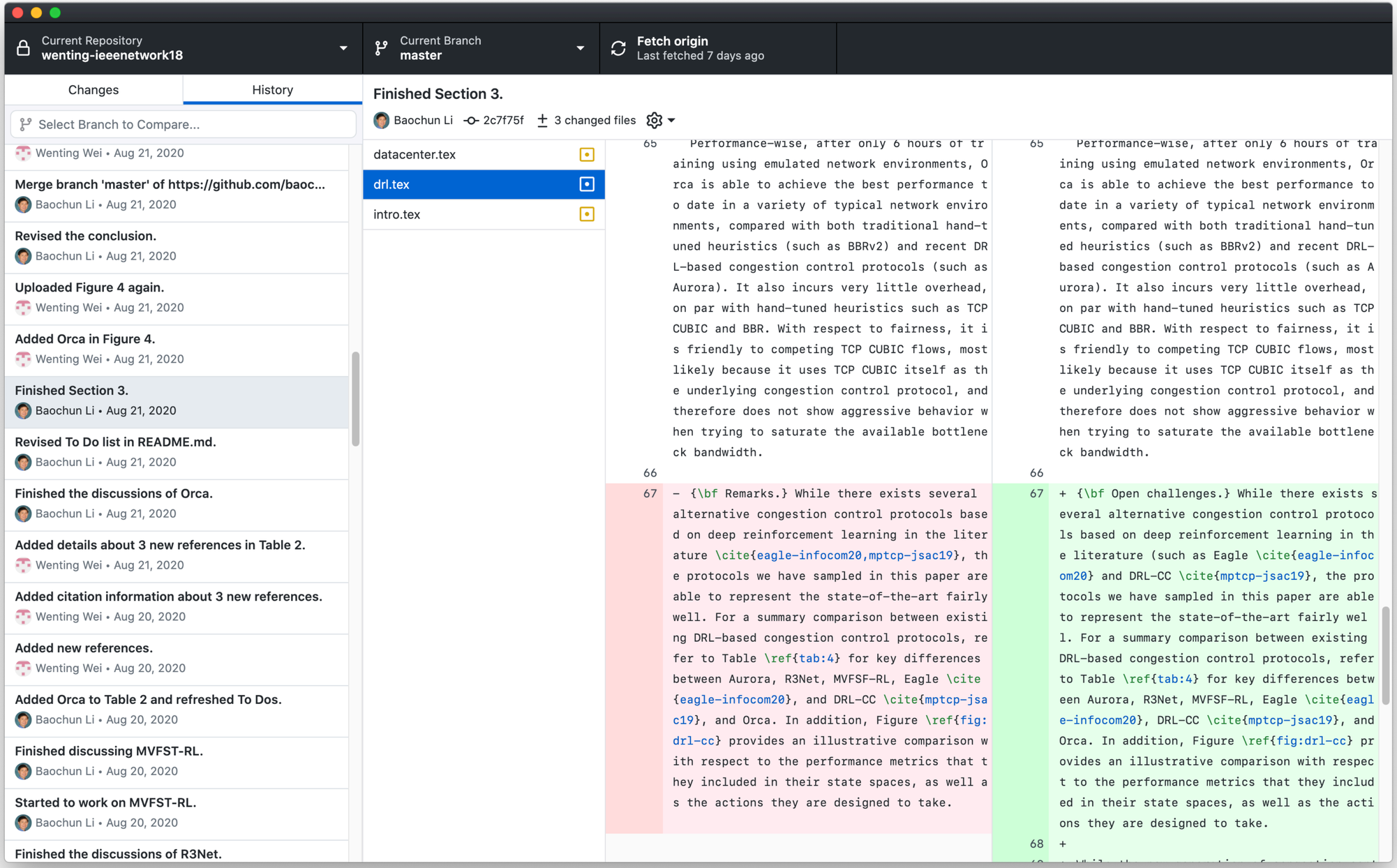
Writing perfect papers: the details

Git repositories help you to track all histories and collaborate with others

Place everything — source code, references — into your git repository

Use any of the public cloud services such as GitHub

Use GitHub Desktop



B

Eliminate typographical and grammatical mistakes

Writing perfect papers: the details

First, eliminate all spelling mistakes by running your paper through a spell checker

Use a UNIX command-line tool such as ispell to check spelling — not Microsoft Word

Then fix grammar and usage problems by proofreading

Proofreading also helps you to fix the remaining spelling mistakes that a spell checker cannot catch

Example: instead of "must," you wrote "mist"

Proofreading also helps you to fix the remaining spelling mistakes that a spell checker cannot catch

Example: instead of "must," you wrote "mist"

You cannot rely on someone else — certainly not the reviewers — to proofread for you, it’s your paper!

C

Use transitional words, phrases, and sentences

Writing perfect papers: the details

Use transitions across the boundary of sentences, paragraphs and sections

Important for readers to follow your flow of ideas

If you don’t add transitions, readers will need to add them subconsciously in their mind, anyway

You are asking readers to do the hard work!

Examples of transitions

Connecting two halves of a sentence —

as, since, or else

Examples of transitions

Connecting sentences —

However, In addition, Further, Nevertheless, Fortunately, Unfortunately, Surprisingly,

To make matters worse, to further exacerbate the problem, The bad news is,

The implications are two-fold, It turns out that, As an example, To take … a step further,

Examples of transitions

Connecting paragraphs and sections —

It only remains to see…

The simple answer to this question is,

The only challenge that remains now is,

To address this challenge,

We first present…

Next, we evaluate…

We are now ready to…

D

Use correct English

Writing perfect papers: the details

Keep punctuation marks inside the closing quotation mark

… making it a “shared secret key”.

... making it a “shared secret key”.

Keep the punctuation mark inside the closing quotation mark

... making it a “shared secret key”.

Keep the punctuation mark inside the closing quotation mark

... making it a “shared secret key.”

Don’t use long sentences

Don’t use long sentences with more than one comma in the middle of the sentence — and abuse “where,” “in which,” “whose,” “so that,” “such that”

Don’t be too colloquial

Don’t use words that are too informal and colloquial

“a lot of” is more colloquial than “a large number of”

Instead of “big,” use “substantial” or “large”

Don’t be too formal either

Overly formal words and phrases sometimes feel awkward

“We endeavour to ascertain that…” — “We show that…”

“It can be ascribed to…” — “It is due to…”

“The overwhelming quantity of…” — “The exceedingly large number of…”

Don’t use words that are too emotional

An “easy” solution to solve the problem above is to share the private key of the original user with other group members as a group private key, however, it is like “suicide”...

A sentence from the first draft of our example paper

Similar emotional words: "kill," "crazy," "happy," "fantastic," "marvellous," or "breathtaking"

An "easy" solution to solve the problem above is to share the private key of the original user with other group members as a group private key, however, it is like "suicide"...

A sentence from the first draft of our example paper

Countable vs. uncountable nouns

If a word is countable, when using its plural form, remember to use "a few," "a number of," "fewer"

Instead of "less bits," use "fewer bits"

If not, do not invent its plural form (such as "performances," "advices," "equipments," "informations"), and use "less" or "lower" rather than "fewer"

Agreement of the verb with the subject

"The figures above shows" vs. "The figures above show"

"These problems that lead to lower efficiency shows that" vs. "... show that"

"Its efficiency in energy savings are remarkable" vs. "... is remarkable"

Slows down reading — your paper can be rejected just because of these problems!

Watch out on common words and phrases

It almost takes a lifetime to master the usage of common words, such as "with", "of", "for", "at", "against", "in", "on"

Or to master the large number of phrases in English

"in other words" or "in another word"?

Oxford Dictionary of English (macOS)

Dictionary (26 found)

perfect

All | English | English Thesaurus | Simplified Chinese | Simplified Chinese - English | Apple | Wikipedia

perfect
perfect binding
perfect cadence
perfect competition
perfect crime
perfect fifth
perfect fifths
perfect fourth
perfect fourths
perfect gas
perfect market
perfect pitch
perfect square
perfect storm
perfecta
perfectibility
perfection
perfectionism
perfectionist
perfective
perfectly
perfecto
perfecter
perfectible
perfectionistic
perfectness

perfect

adjective | ˈpəːfɪkt |

1 having all the required or desirable elements, qualities, or characteristics; as good as it is possible to be: *life certainly isn't perfect at the moment* | *a perfect summer's day*.
- free from any flaw or defect in condition or quality; faultless: *the equipment was in perfect condition*.
- precisely accurate; exact: *a perfect circle*.
- highly suitable for someone or something; exactly right: *with a little help you can create a room that is perfect for you* | *the perfect present for golfers everywhere*.
- *dated* thoroughly trained in or conversant with: *she was **perfect in** French*.

2 *[attributive]* absolute; complete (used for emphasis): *a perfect stranger* | *all that Joseph said made perfect sense to me*.

3 *Mathematics* (of a number) equal to the sum of its positive divisors, e.g. the number 6, whose divisors (1, 2, 3) also add up to 6.

4 *Grammar* (of a tense) denoting a completed action or a state or habitual action which began in the past. The perfect tense is formed in English with *have* or *has* and the past participle, as in *they have eaten* and *they have been eating* (**present perfect**), *they had eaten* (**past perfect**), and *they will have eaten* (**future perfect**).

5 *Botany* (of a flower) having both stamens and carpels present and functional.
- *Botany* denoting the stage or state of a fungus in which the sexually produced spores are formed.
- *Entomology* (of an insect) fully adult and (typically) winged.

verb | pəˈfɛkt | *[with object]*

make (something) completely free from faults or defects; make as good as possible: *he's busy perfecting his bowling technique*.

- *archaic* bring to completion; finish: *then urg'd, she perfects her illustrious toils*.
- complete (a printed sheet of paper) by printing the second side: *the heap was normally printed as white paper in the morning, turned at the midday break, and perfected in the afternoon*.
- *Law* satisfy the necessary conditions or requirements for the transfer of (a gift, title, etc.): *equity will not perfect an imperfect gift*.

noun | ˈpəːfɪkt | **(the perfect)** *Grammar*

the perfect tense.

DERIVATIVES

perfecter | ˈpəːfɛktə | noun
perfectible | pəˈfɛktɪb(ə)l | adjective
perfectness | ˈpəːfɪktnəs | noun

ORIGIN

Middle English: from Old French ***perfet***, from Latin ***perfectus*** 'completed', from the verb ***perficere***, from ***per-*** 'through, completely' + ***facere*** 'do'.

Example sentences

Oxford Dictionary of English (macOS)

Dictionary (1 found)

In other wo

All | English | English Thesaurus | Simplified Chinese | Simplified Chinese - English | Apple | Wikipedia

in other words

used to express agreement or affirmation: *Word, that's a good record, man*.

PHRASES

at a word
as soon as requested: *ready to leave again at a word*.

be as good as one's word
do what one has promised to do: *Philip was as good as his word about turning Richard into an actor*.

have a word
speak briefly to someone: *I'll just **have a word with** him*.

have a word in someone's ear
British speak to someone privately or discreetly, especially to give them a warning: *back in those days the referee would have a quiet word in your ear and warn you not to do it again*.

in other words
expressed in a different way; that is to say: *The new cat treat has a 90-plus palatability level. In other words, cats like it*.

in so many words
[often with negative] precisely in the way mentioned: *I haven't told him in so many words, but he'd understand*.

in a word
briefly: *Are there any real reasons to worry? In a word, plenty*.

keep one's word
do what one has promised: *you know that I always keep my word*.

a man/woman of his/her word
a person who keeps their promises: *she was a woman of her word*.

(on/upon) my word
an exclamation of surprise or emphasis: *my word, you were here quickly!*

of few words
taciturn: *he's a man of few words*.

put something into words
express something in speech or writing: *he felt a vague disappointment which he couldn't put into words*.

put words into someone's mouth
inaccurately report what someone has said.
- prompt someone to say something that they may not otherwise have said.

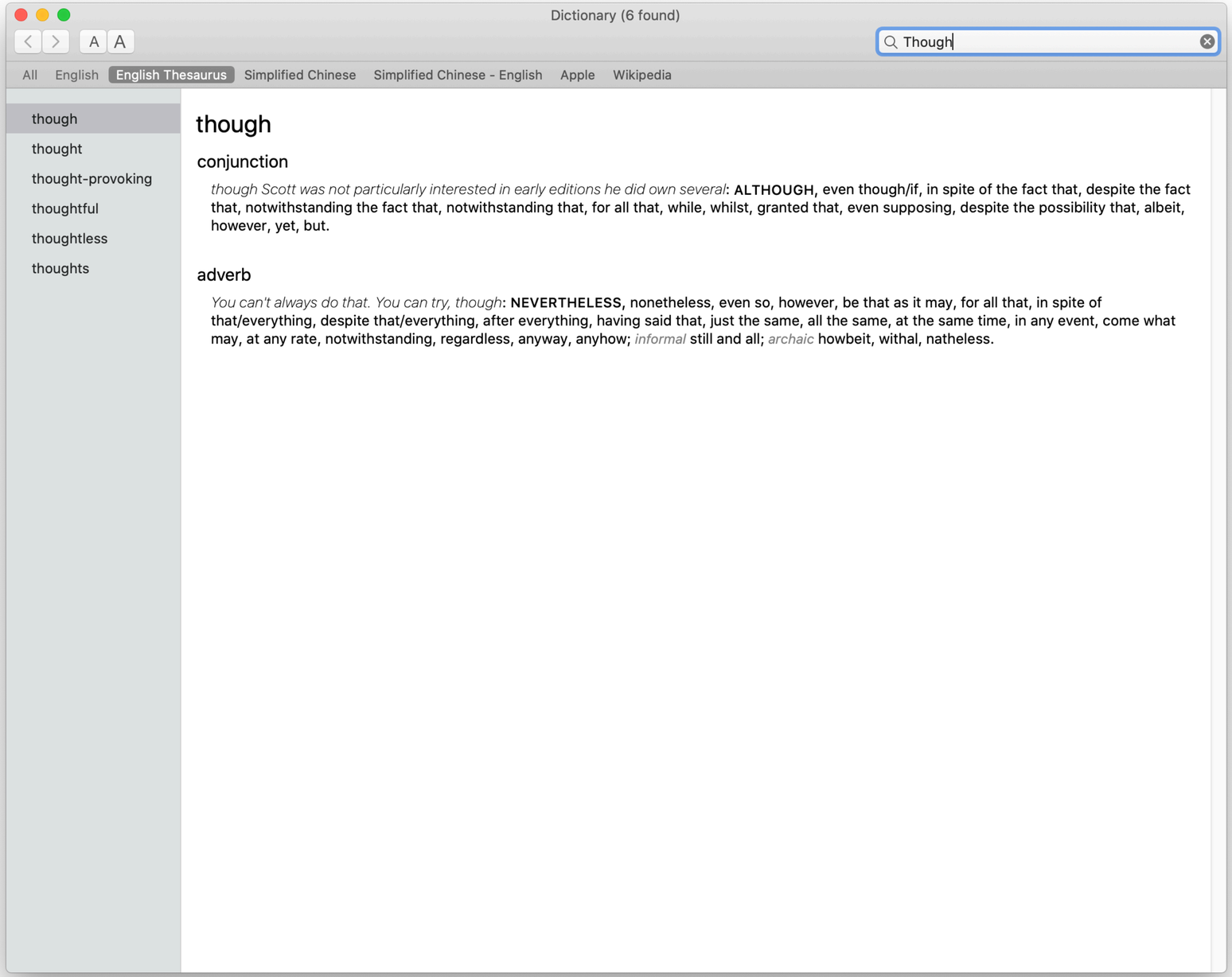
spread the word
share the information or news: *he spread the word about the charity's work*.

take someone at their word
interpret a person's words literally, especially by believing them or doing as they suggest: *I take him at his word, for I cannot go to see for myself*.

take the words out of someone's mouth

Phrases

Oxford Dictionary of English (macOS)



Thesaurus

Articles as determiners

The articles "a" / "an" (the indefinite article) and "the" (the definite article) are frequently used incorrectly by new students

Plural nouns are typically used without an article:

"The source node receives acknowledgments" (not "the acknowledgments")

The indefinite article is weaker than the definite article:

"a large portion of" (not "the large portion of")

But there's no need for "the" in section titles — instead of "The System Model," just say "System Model."

Articles can be tricky to use, but there are too many of them in a paper — pay attention!

Let’s take a look at one example sentence

The extent to which the users can effectively communicate with the service providers depend on the size of community.

The extent to which the users can effectively communicate with the service providers depend on the size of community.

Plural noun: “users” —
the definite article is not needed

The extent to which the users can effectively communicate with the service providers depend on the size of community.

Plural phrase: “service providers”

The extent to which the users can effectively communicate with the service providers depend on the size of community.

Plural phrase: “service providers” — the definite article is not needed, but it feels strange without it, too

The extent to which the users can effectively communicate with their service providers depend on the size of community.

It would only be correct to use "their" as the determiner

The extent to which users can effectively communicate with their service providers depend on the size of community.

Good enough?

The extent to which users can effectively communicate with their service providers depend on the size of community.

The subject needs to agree with the verb

The extent to which users can effectively communicate with their service providers depends on the size of community.

The subject needs to agree with the verb

The extent to which users can effectively communicate with their service providers depends on the size of community.

Perfect?

The extent to which users can effectively communicate with their service providers depends on the size of community.

The noun "community" needs a determiner in front of it

The extent to which users can effectively communicate with their service providers depends on the size of a community.

The extent to which users can effectively communicate with their service providers depends on the size of a community.

The community in question is a specific community, not an arbitrary one

The extent to which users can effectively communicate with their service providers depends on the size of the community.

The extent to which users can effectively communicate with their service providers depends on the size of the community.

This is good enough, but it's even better to reinforce the idea of which community is being discussed

The extent to which users can effectively communicate with their service providers depends on the size of their community.

The extent to which users can effectively communicate with their service providers depends on the size of their community.

Perfect!

Good news: most English problems are not hard to fix — just proofread every sentence with plenty of time!

E

Typeset your paper correctly and beautifully

Writing perfect papers: the details

E.1

Use LaTeX, no matter what

You do need to spend some time learning how to use LaTeX

But the typesetting results are dramatically better

No ligature

Efficient

efficient

Correct ligature

In fact, my mind doesn’t work efficiently when reading a paper typeset in Word

There is a huge amount of useful information about LaTeX on the web — no excuse!

E.2

Draw figures using a vector-based application

Image-based drawing applications produce images that become fuzzy when zoomed in on a reader’s iPad

Recommendation: draw.io

https://diagrams.net

app.diagrams.net/?libs=general;uml#

Federated Learning | Duetone | Investing | Workouts | Financial Services | Manuscript Central | Entertainment and... | Books and YouTub...

Untitled Diagram.drawio

File Edit View Arrange Extras Help

Share

100%

Search Shapes

Scratchpad

Drag elements here

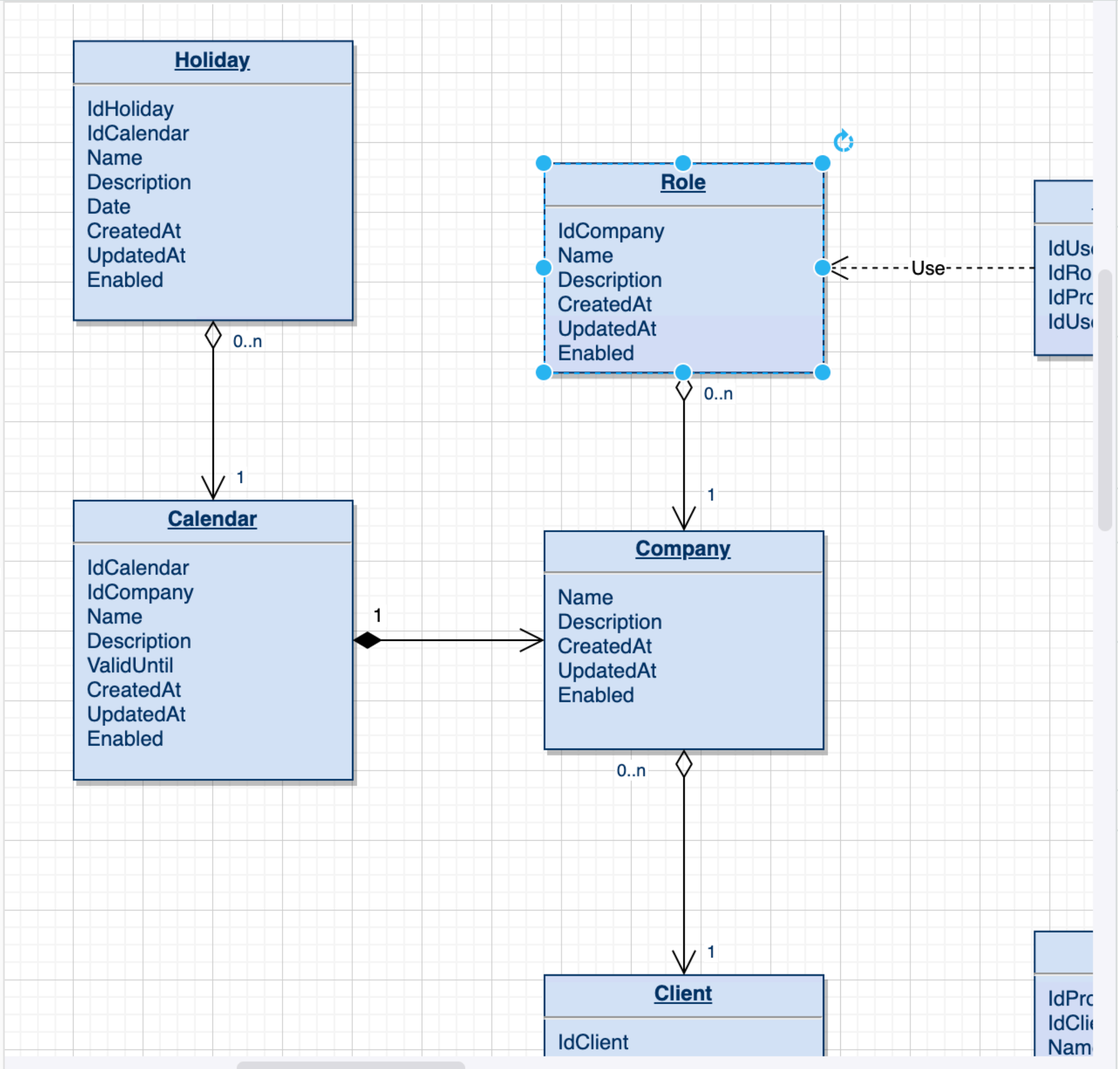
General

Misc

Advanced

UML

+ More Shapes...



Page-1

Style | Text | Arrange

Fill

Gradient

Line

1 pt

Perimeter

0 pt

Opacity

100 %

Rounded

Shadow

Glass

Sketch

Edit Style | Edit Image

Copy Style | Paste Style

Set as Default Style

Property | Value

E.3

Proofread your bibliography and make it consistent

Use BibTeX to typeset the bibliography in your paper

After downloading BibTeX entries from the web, proofread to get them consistent

Keep a consistent style of abbreviating journal and conference titles throughout the bibliography

Try your best to find out the venue where the paper was published in, rather than citing arxiv.org

1

Writing perfect papers

1.1

The story

Writing perfect papers

1.2

The work

Writing perfect papers

1.3

The art

Writing perfect papers

1.4

The details

Writing perfect papers

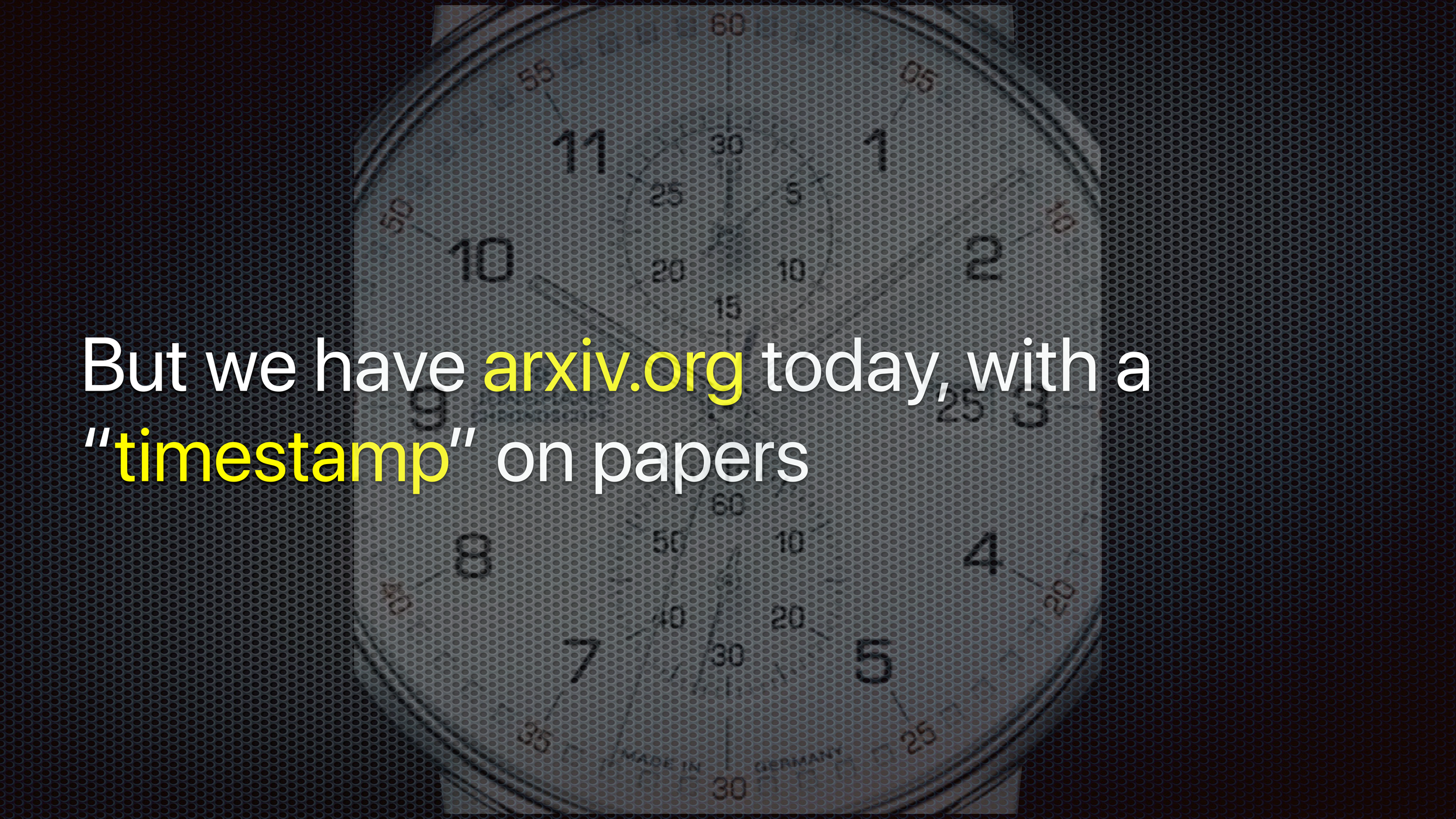
2

Writing good papers fast!

Writing good papers is hard

That’s why you are advised to write slowly

In the good old days, academics can take years to write one research paper

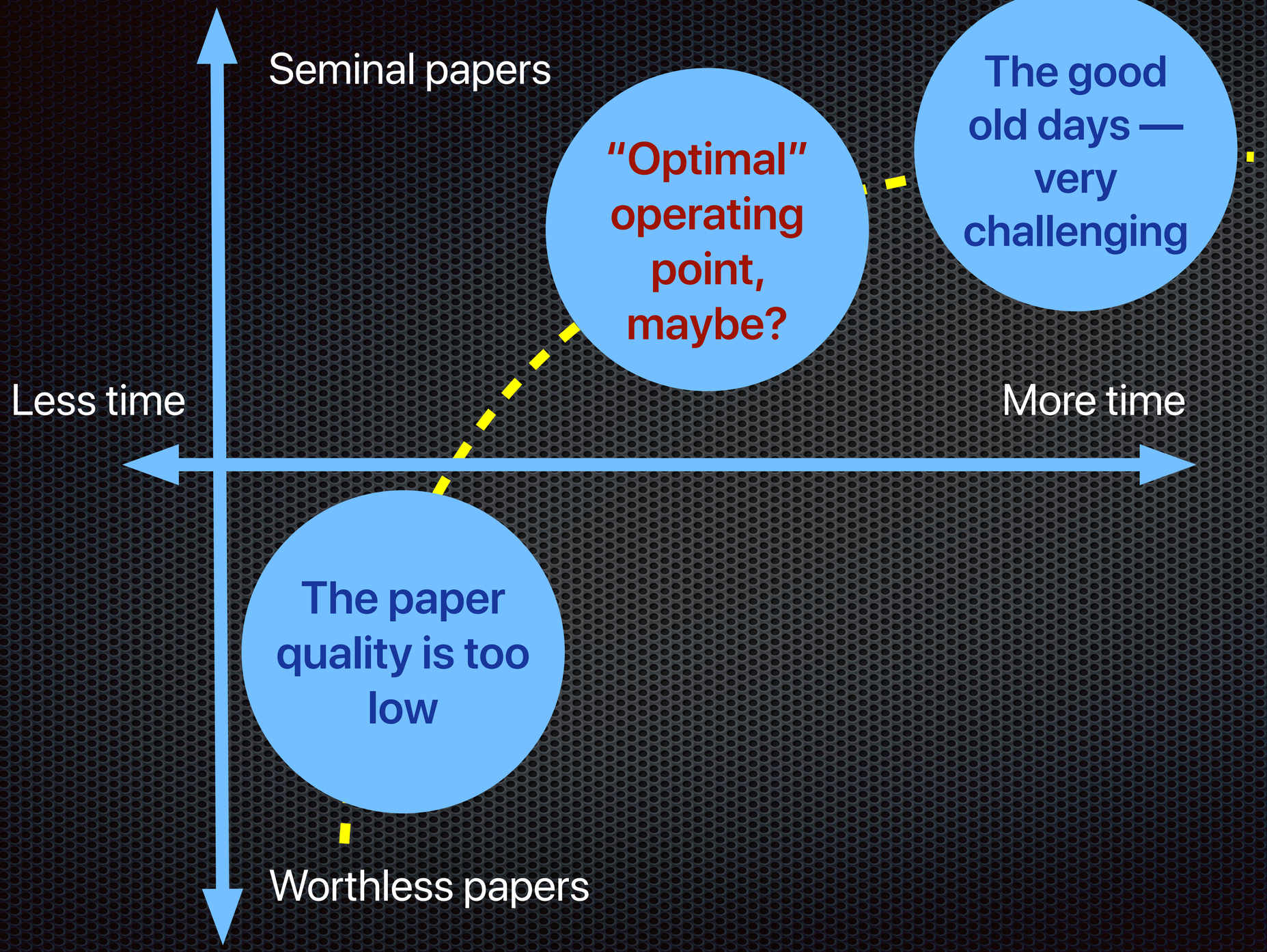


But we have arxiv.org today, with a "timestamp" on papers

We also have the “publish or perish” culture, where the number of papers is an indication of quality

I need to graduate — tell me how to write papers quickly

If others travel at the speed of sound, you wish to be supersonic


Seminal papers
"Optimal" operating point, maybe?
The good old days — very challenging
Less time
More time
The paper quality is too low
Worthless papers

$$\max Q(p)$$

$$\text{subject to } t(p) \leq T$$

2

Writing good papers fast

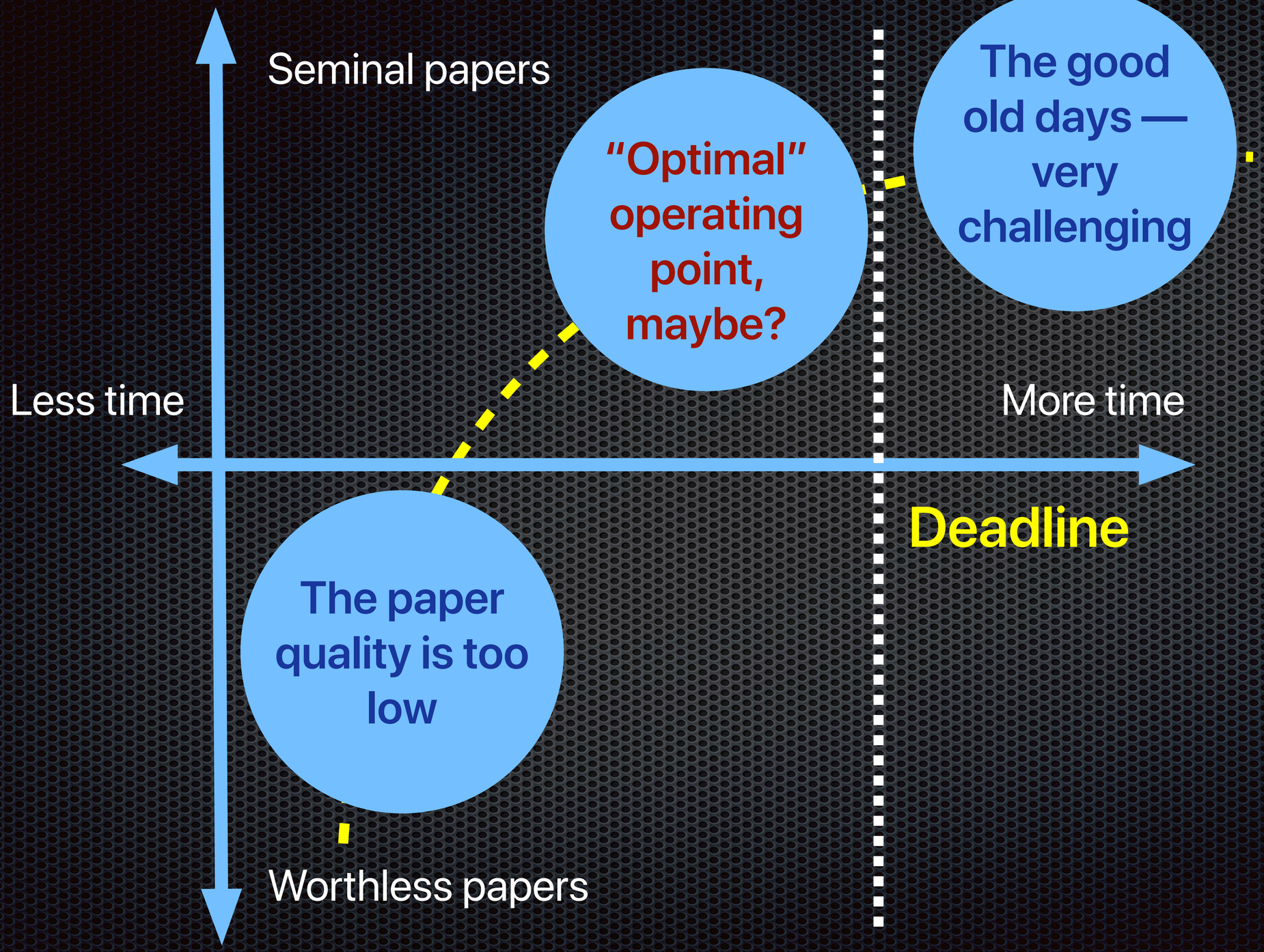
I am going to talk about three things

2.1

Know your deadline

Writing good papers fast

$$t(p) \leq T$$


Seminal papers
"Optimal" operating point, maybe?
The good old days — very challenging
Less time
More time
Deadline
The paper quality is too low
Worthless papers

At all times, always work towards a paper deadline

Deadlines are all equal

It doesn’t matter what kind of deadline it is —

- a conference deadline
- a deadline from a journal special issue
- a deadline you set up yourself for submitting a journal paper

dead · line — you will have to make it no matter what happens

But how do I guarantee that I will make my deadline?

A

Set your deadline
realistically

Writing good papers fast: know your deadline

Admit that you are not able to write a good paper in a month or two

But a deadline six months later may not carry a lot of weight either — unless you are extremely disciplined

B

Make it public knowledge

Writing good papers fast: know your deadline

Tell as many people as you can when your deadline will be

So that it feels like a public disgrace if you fail to meet the deadline

As a researcher, you sure wish to be seen as responsible and dependable

You work around the clock to make sure that others who depend on you will have the peace of mind that the work will be done

And done by the deadline

C

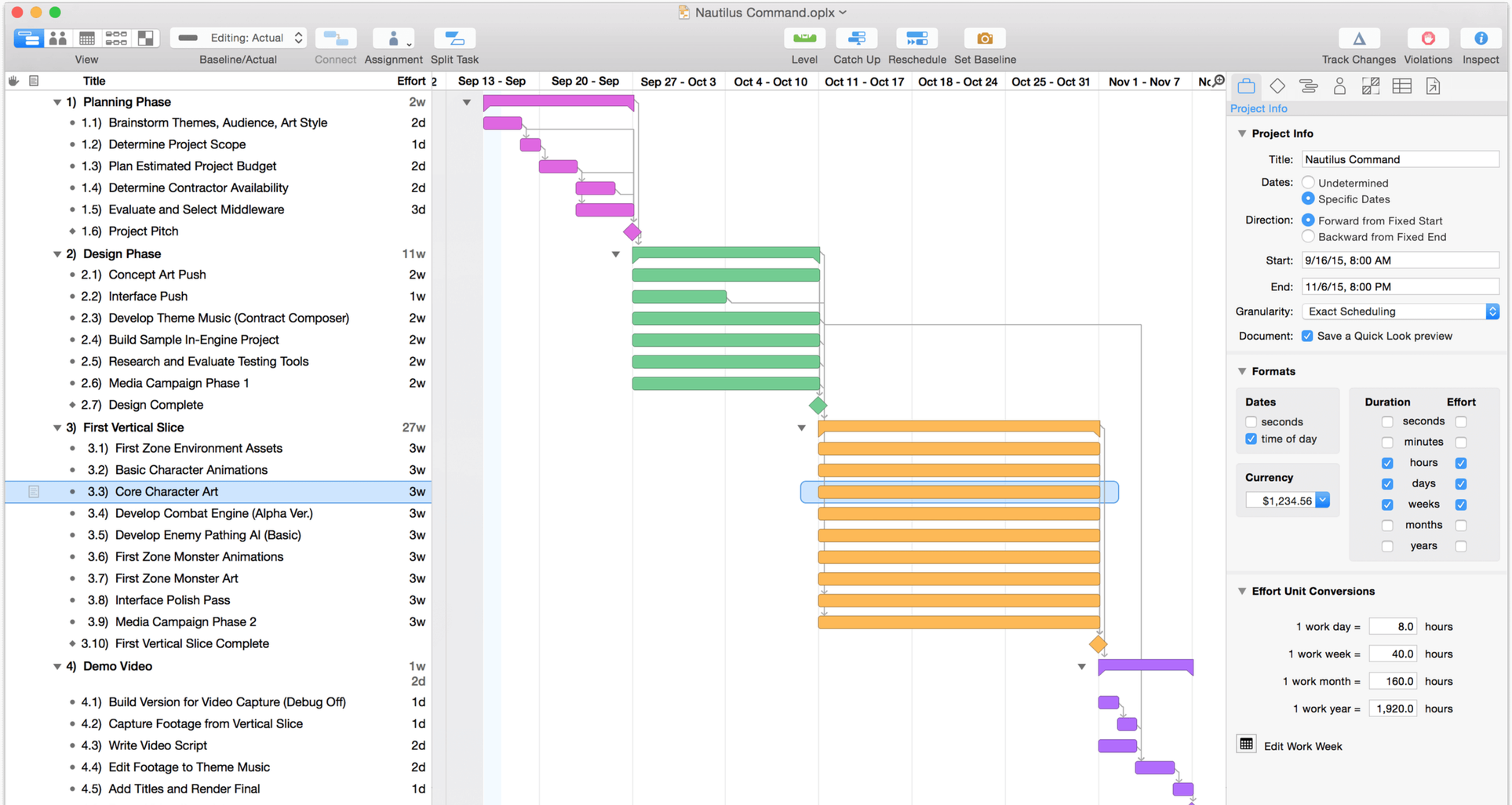
Allocate your time well

Writing good papers fast: know your deadline

Design a rough timeline at the very beginning

Assign deadlines to each milestone in your timeline

Use a Gantt chart



If necessary, revise your timeline along the way

But think seriously why you missed your milestone deadlines

Don’t procrastinate and delay all the work to the days before the deadline

It may be feasible, but it will be stressful and it degrades the quality of your work

2.2

Don’t follow, lead!

Writing good papers fast

You are the first author of the new paper, right?

Then you are the leader, the boss, and the person who cares most about this work

Start your team at the beginning of your project

Only invite trustworthy collaborators when building your team

Your collaborators include your advisors — get them to work for you

Get them to commit their time

Warn them of the tough work ahead along the way

Promise them an exciting outcome

Assign your collaborators to milestones — they are your “resources”

Remind them about their milestone deadlines often

Persist if they forget about your requests

Cancel their “membership” in your team if they consistently fail

Have backup plans if they fail to deliver by the deadline

2.3

Choose a problem with the right size

Writing good papers fast

It must be feasible to be completed before the deadline

Goal: make solid improvements over one paper, and one paper only

Choose a paper that you enjoyed reading

Or even better, a paper with source code

If its source code is not on GitHub, ask the authors

If you don’t have source code, estimate the amount of time to reproduce the work

If it may take a long time, give up and choose another paper

Read the paper along with its source code

The source code contains secret ingredients in its “recipe”

It helps you to understand the paper completely and deeply

And only with a complete and deep understanding can you create something new

And create something new quickly

To do it, you will have to have a deadline in your timeline for creating something new

A deadline forces you to think long and hard

Revise the source code and do a feasibility test for your idea

If its feasibility is promising, think about its theoretical properties — anything provably correct?

Your little problem must fit into the scope of the conference you'll submit to

Goal: get the paper accepted

Many conferences have their favoured research topics

2

Writing good papers fast!

2.1

Know your deadline

Writing good papers fast

2.2

Don’t follow, lead!

Writing good papers fast

2.3

Choose a problem with the right size

Writing good papers fast

That’s it!

Good luck with your papers!

Baochun Li

iqua.ece.toronto.edu