



Research Methodology

Step 10: Publishing your research paper(s)

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Outlines:

- Why we write paper and publish
- The purpose of your paper (Idea and Plan)
- Conference paper structure
- Journal paper structure
- The process of write
- Language and style



Why write and publish research papers



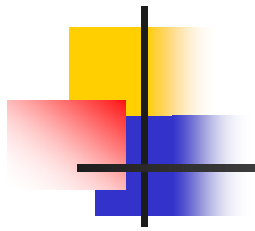
Why write and publish research papers?

Ideally -

- to share research findings and discoveries with the hope of improving healthcare.

Practically -

- to get funding
- to get promoted
- to get a job
- to keep your job!



Just Remember

"Scientists are rated by what they finish, not by what they attempt"



Writing papers is a skill

- Many papers are badly written
- Good writing is a skill you can learn
- It's a skill that is worth learning:
 - You will get more brownie points (more papers accepted etc)
 - Your ideas will have more impact
 - You will have better ideas

Increasing importance



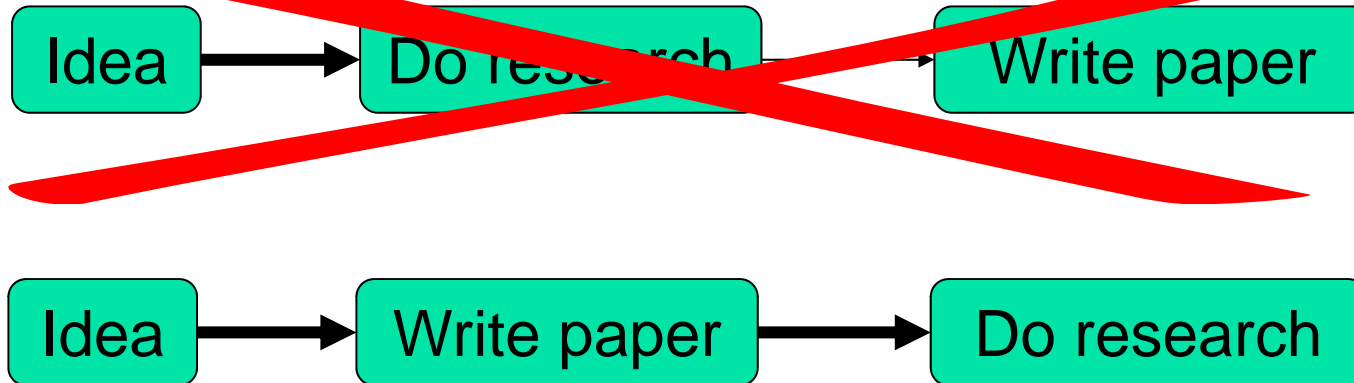
“There is no way to get experience except through experience.”



Writing papers: model 1



Writing papers: model 2



- Forces us to be clear, focused
- Crystallises what we don't understand
- Opens the way to dialogue with others: reality check, and collaboration



The purpose of your paper



Why bother?

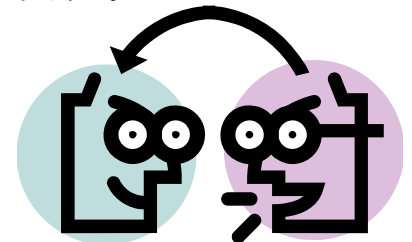
Fallacy

we write papers and give talks mainly to impress others, gain recognition, and get promoted

Good papers and talks are a fundamental part of research excellence

Papers communicate ideas

- Your goal: to infect the mind of your reader with **your idea**, like a virus
- Papers are far more durable than programs (think Mozart)



The greatest ideas are (literally)
worthless if you keep them to
yourself



The Idea

Idea

A re-usable insight,
useful to the reader

- Figure out what your idea is
- Make certain that the reader is in no doubt what the idea is. Be 100% explicit:
 - "The main idea of this paper is...."
 - "In this section we present the main contributions of the paper."
- Many papers contain good ideas, but do not distil what they are.



One ping

- Your paper should have just one “ping”: one clear, sharp idea
- Read your paper again: can you hear the “ping”?
- You may not know exactly what the ping is when you start writing; but you must know when you finish
- If you have lots of ideas, write lots of papers

Your narrative flow

- Here is a problem
- It's an interesting problem
- It's an unsolved problem
- **Here is my idea**
- My idea works (details, data)
- Here's how my idea compares to other people's approaches

I wish I knew how to solve that!

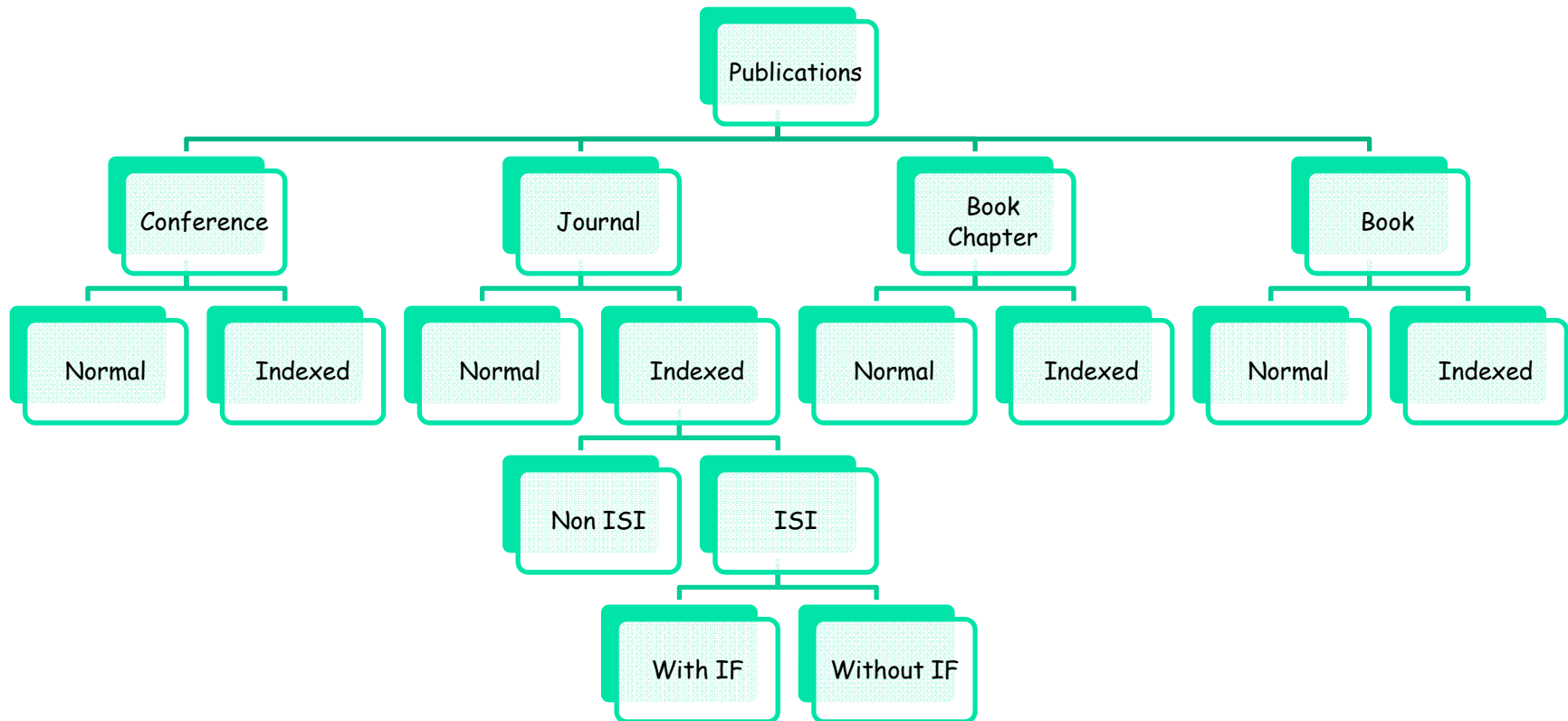
I see how that works. Ingenious!





Type of Publications

Type of Publications





Conference Papers



Structure of a Conference paper

- Title (1000 readers)
- Abstract (5-6 sentences, 100 readers)
- Keywords (5-6 words or phrases)
- Introduction (1-1.5 page, 100 readers)
- The problem (1 page, 10 readers)
- Related work (1-2 pages, 10 readers)
- Proposed idea (2 pages, 10 readers)
- Details (2 pages, 3 readers)
- Conclusions and further work (5-6 sentences-100 readers)
- Acknowledgement
- References



Title

- title plays major role to driving long term search engine traffic
- The title serves to give an indication of what the article is about, and to distinguish it from other articles
- Attention:
 - Use lower case, except for proper names
 - Use the singular form
 - Avoid abbreviations
 - Avoid definite and indefinite articles (*the, a* and *an*) unless part of a proper name (*The Old Method*)
 - Use nouns
 - Do not enclose titles in quotes
 - Do not use titles suggesting that one article forms part of another



Structure of a **Conference** paper

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The abstract

- I usually write the abstract last
- Used by program committee members to decide which papers to read
- Four sentences
 1. State the problem
 2. Say why it's an interesting problem
 3. Say what your solution achieves
 4. Say what follows from your solution



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Keywords

- 5 or 6 keywords
- they can use to classify and organize your content
- Search engines and readers can easily find your article if it is related to what they are looking for
- You might have to choose them from a list already prepared of most commonly used keywords, most journals accept a personalized list
- Find related articles' keywords in your area



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The introduction (1 page)

1. **Describe the problem**
 2. **State your contributions**
- ...and that is all

ONE PAGE!



Describe the problem

Introduction:

In recent years, computer and network security has been formulated as a technical problem. A key area in security research is authentication which is the determination of whether a user should be allowed access to a given system or resource. In this respect, the password is a common and widely authentication method still used up to now.

A password is a form of secret authentication data that is used to control access to a resource. It is kept secret from those not allowed access, and those wishing to gain access are tested on whether or not they know the password and are granted or denied access accordingly.

The use of passwords goes back to ancient times when soldiers guarding a location by exchange a password and then only allow a person who knew the password. In modern times, passwords are used to control access to protect computer operating systems, mobile phones, auto teller machine (ATM) machines, and others. A typical computer user may require passwords for many purposes such log in to computer accounts, retrieving e-mail from servers, accessing to files, databases, networks, web sites, and even reading the morning newspaper online.

Use an
example to
introduce the
problem



State your contributions

- Write the list of contributions first
- **The list of contributions drives the entire paper:** the paper substantiates the claims you have made



State your contributions

In graphical password, the problem arises because passwords are expected to have two fundamentals requirements:

Password should be easy to remember.

Password should be secured.

Graphical passwords were originally described by Blonder [5]. In his description, an image would appear on the screen, and the user would click on a few chosen regions of it. If the correct regions were clicked in, the user would be authenticated. Memorize ability of password and efficiency of their inputs is two key human factors criteria. Memorize ability have two aspects:

- How the user chooses and encodes the password?
- What task the user does when retrieving the password?

In a graphical password system, a user needs to choose memorable image. The process of choosing memorable images depends on the nature of the process of image and the specific sequence of click locations. In order to support memorize ability, images should have meaningful content because meaning for arbitrary things is poor.

Bulleted list
of
contributions

Do not leave the
reader to guess what
your contributions are!



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No related work yet

- **Problem 1:** the reader knows nothing about the problem yet; so your (carefully trimmed) description of various technical tradeoffs is absolutely incomprehensible
- **Problem 2:** describing alternative approaches gets between the reader and your idea

I feel stupid



I feel tired



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Related work

Fallacy

To make my work look good, I have to make other people's work look bad



The truth: credit is not like money

Giving credit to others does not diminish the credit you get from your paper

- Warmly acknowledge people who have helped you
- Be generous to the competition. "In his inspiring paper [Foo98] Foogle shows.... We develop his foundation in the following ways..."
- Acknowledge weaknesses in your approach



Credit is not like money

Failing to give credit to others
can kill your paper

If you imply that an idea is yours, and the referee knows it is not, then either

- You don't know that it's an old idea (bad)
- You do know, but are pretending it's yours (very bad)



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Presenting the idea

3. The idea

Consider a bifurcated semi-lattice D , over a hyper-modulated signature S . Suppose p_i is an element of D . Then we know for every such p_i there is an epimodulus j , such that $p_j < p_i$.

- Sounds impressive...but
- Sends readers to sleep
- In a paper you **MUST** provide the details, but **FIRST** convey the idea



Presenting the idea

- Explain it as if you were speaking to someone using a whiteboard
- **Do not** recapitulate your personal journey of discovery. This route may be soaked with your blood, but that is not interesting to the reader.
- Instead, choose the most direct route to the idea.



The payload of your paper

Introduce the problem, and your
idea, using

EXAMPLES

and only then present the
general case

Using examples

7. Pass-Go Scheme

In 2006, this scheme created as an improvement of DAS algorithm which kept the advantages of the DAS plus adding some extra security features to it. This is a scheme based on grid which users to select intersections, instead of cells so the new system refers to a matrix of intersections, rather than cells as in DAS. As an intersection is actually a point which doesn't have an area, it would be impossible for a user to touch it without an error tolerance mechanism. Therefore sensitive areas defined to address this problem (Figure 11).

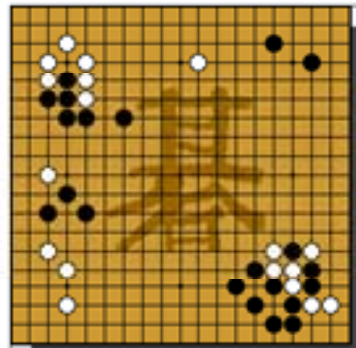


Figure 11: Pass-Go Scheme, 2006

Example
right
away

Changing the format of typing from cell to intersection bring the user more free choices. The other difference between these two algorithms is that the size of grid in enhanced method changes to 9*9.



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Conclusions and further work

- Be brief.
- Read your **Abstract** again and again



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Acknowledgement

Express your thankful to

- Any fund or financial support for your project
- Any people who support/help / or advice you



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References

- Use Endnotes
- Check "Conference Template"
- Check "Instruction for Authors"
- All references must be cited in the body
- You must delete the reference which is no cited in the body
- Using journals, books, review/survey articles as references



Tips

1. Know the Conference, its editors, and why you submitted the paper there
2. Pay close attention to spelling, grammar, and punctuation
3. Make sure references are comprehensive and accurate
4. Avoid careless mistakes
5. Read and conform to "Instructions for Authors" or "Submission" section



Journal Papers



Types of journal papers

- Review or Survey (evaluate the previous works)
- Technical notes (deep and detail)
- Scientific paper (journal such as news)



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Data collection and methods...

- All technical part and weight of your paper
- Any formula or theory
- How did you collect and gathered data for your research
- Example: Questionnaire, Interview, Observation, Simulator, Implementation and programming



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Analysis / Results...

- Add data to your methodology
- Use diagrams and tables
- Using analysis techniques
- Compare with other current works

Analysis / Results

The steps of Chang's extent analysis can be given as follows:

Step1:

The value of the fuzzy synthetic extent with respect to the i th object is defined as (Eq. 6):

$$S_i = \sum_{j=1}^m M_{ij}^{j_1} \cdot \left[\sum_{i=1}^n \sum_{j=1}^m M_{ij}^{j_1} \right]^{-1}$$

To obtain $\sum_{i=1}^n M_{ij}^{j_1}$, perform the fuzzy addition operation of m extent analysis values for a particular matrix as (Eq. 7):

$$\sum_{j=1}^m M_{ij}^{j_1} = \left(\sum_{j=1}^m a_{ij}, \sum_{j=1}^m b_{ij}, \sum_{j=1}^m c_{ij} \right), \quad i = 1, 2, \dots, n$$

Regarding to the fuzzy addition operation such as Eq. 5, it is possible to define (Eq. 8):

$$\sum_{i=1}^n \sum_{j=1}^m M_{ij}^{j_1} = \left(\sum_{i=1}^n \sum_{j=1}^m a_{ij}, \sum_{i=1}^n \sum_{j=1}^m b_{ij}, \sum_{i=1}^n \sum_{j=1}^m c_{ij} \right)$$

And then compute the inverse of the vector in Eq. 8 such that (Eq. 9):

$$\left[\sum_{i=1}^n \sum_{j=1}^m M_{ij}^{j_1} \right]^{-1} = \left(\frac{1}{\sum_{i=1}^n \sum_{j=1}^m a_{ij}}, \frac{1}{\sum_{i=1}^n \sum_{j=1}^m b_{ij}}, \frac{1}{\sum_{i=1}^n \sum_{j=1}^m c_{ij}} \right)$$

So it is possible to compute S_i such that (Eq. 10):

$$S_i = \left(\sum_{j=1}^m a_{ij}, \sum_{j=1}^m b_{ij}, \sum_{j=1}^m c_{ij} \right) \cdot \left(\frac{1}{\sum_{i=1}^n \sum_{j=1}^m a_{ij}}, \frac{1}{\sum_{i=1}^n \sum_{j=1}^m b_{ij}}, \frac{1}{\sum_{i=1}^n \sum_{j=1}^m c_{ij}} \right), \quad i = 1, 2, \dots, n$$

Step2:

The degree of possibility of $M_2 = (a_2, b_2, c_2) \geq M_1 = (a_1, b_1, c_1)$ is defined as (Eq. 11):

$$Sc3 = (7.343, 13.533, 20.330) \otimes (0.005, 0.008, 0.013) = (0.040, 0.106, 0.258)$$

$$Sc4 = (6.543, 10.867, 16.333) \otimes (0.005, 0.008, 0.013) = (0.036, 0.085, 0.207)$$

$$Sc5 = (6.543, 6.867, 8.333) \otimes (0.005, 0.008, 0.013) = (0.036, 0.054, 0.106)$$

$$Sc6 = (9.343, 15.533, 22.333) \otimes (0.005, 0.008, 0.013) = (0.051, 0.122, 0.283)$$

$$Sc7 = (5.743, 8.200, 12.333) \otimes (0.005, 0.008, 0.013) = (0.031, 0.064, 0.156)$$

$$Sc8 = (4.886, 5.400, 7.667) \otimes (0.005, 0.008, 0.013) = (0.027, 0.042, 0.097)$$

$$Sc9 = (6.543, 6.867, 8.333) \otimes (0.005, 0.008, 0.013) = (0.036, 0.054, 0.106)$$

These values are obtained by comparing the fuzzy values using Eq. 12:

V(Sc1aSc1)=	-	V(Sc1aSc2)=	1.000	V(Sc1aSc3)=	1.000	V(Sc1aSc4)=	0.624	V(Sc1aSc5)=	0.309
V(Sc1aSc2)=	0.797	V(Sc1aSc3)=	-	V(Sc1aSc4)=	0.418	V(Sc1aSc5)=	0.285	V(Sc1aSc6)=	1.000
V(Sc1aSc3)=	1.000	V(Sc1aSc4)=	1.000	V(Sc1aSc5)=	-	V(Sc1aSc6)=	0.888	V(Sc1aSc7)=	0.556
V(Sc1aSc4)=	1.000	V(Sc1aSc5)=	1.000	V(Sc1aSc6)=	1.000	V(Sc1aSc7)=	-	V(Sc1aSc8)=	0.690
V(Sc1aSc5)=	1.000	V(Sc1aSc6)=	1.000	V(Sc1aSc7)=	1.000	V(Sc1aSc8)=	1.000	V(Sc1aSc9)=	-
V(Sc1aSc6)=	1.000	V(Sc1aSc7)=	1.000	V(Sc1aSc8)=	0.929	V(Sc1aSc9)=	0.810	V(Sc1aSc10)=	0.443
V(Sc1aSc7)=	1.000	V(Sc1aSc8)=	1.000	V(Sc1aSc9)=	1.000	V(Sc1aSc10)=	1.000	V(Sc1aSc11)=	0.878
V(Sc1aSc8)=	1.000	V(Sc1aSc9)=	1.000	V(Sc1aSc10)=	1.000	V(Sc1aSc11)=	1.000	V(Sc1aSc12)=	1.000
V(Sc1aSc9)=	1.000	V(Sc1aSc10)=	1.000	V(Sc1aSc11)=	1.000	V(Sc1aSc12)=	1.000	V(Sc1aSc13)=	1.000
V(Sc2aSc1)=	0.799	V(Sc2aSc2)=	0.480	V(Sc2aSc3)=	0.258	V(Sc2aSc4)=	0.309	V(Sc2aSc5)=	0.309
V(Sc2aSc2)=	0.483	V(Sc2aSc3)=	0.120	V(Sc2aSc4)=	0.276	V(Sc2aSc5)=	0.339	V(Sc2aSc6)=	0.339
V(Sc2aSc3)=	1.000	V(Sc2aSc4)=	0.735	V(Sc2aSc5)=	0.472	V(Sc2aSc6)=	0.556	V(Sc2aSc7)=	0.556
V(Sc2aSc4)=	1.000	V(Sc2aSc5)=	0.832	V(Sc2aSc6)=	0.589	V(Sc2aSc7)=	0.690	V(Sc2aSc8)=	0.690
V(Sc2aSc5)=	1.000	V(Sc2aSc6)=	1.000	V(Sc2aSc7)=	0.842	V(Sc2aSc8)=	1.000	V(Sc2aSc9)=	1.000
V(Sc2aSc6)=	-	V(Sc2aSc7)=	0.646	V(Sc2aSc8)=	0.367	V(Sc2aSc9)=	0.443	V(Sc2aSc10)=	0.443
V(Sc2aSc7)=	1.000	V(Sc2aSc8)=	-	V(Sc2aSc9)=	0.750	V(Sc2aSc10)=	0.876	V(Sc2aSc11)=	0.876
V(Sc2aSc8)=	1.000	V(Sc2aSc9)=	1.000	V(Sc2aSc10)=	-	V(Sc2aSc11)=	1.000	V(Sc2aSc12)=	1.000
V(Sc2aSc9)=	1.000	V(Sc2aSc10)=	1.000	V(Sc2aSc11)=	0.842	V(Sc2aSc12)=	-	V(Sc2aSc13)=	-

Eq. 14 is used to calculate the priority weights:



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Discussion

- Find your "Ping"
- Highlight your novelty and idea
- Show the evaluation result



Discussion

The questions were analyzed with the Kruskal Wallis test, which is a non-parametric test used for k-independent samples. Ryan's test was used for follow-up testing. There were differences on three of the questions. For "it did not take me long to input my password correctly 10 times" the follow-up test showed that the MURAL and MAP groups agreed more strongly with this statement than the POOL group ($p < .05$). For "inputting my password was easy" and "inputting my password was fast" the significant difference ($p < .05$) was between MURAL and POOL, with MURAL having more positive perceptions.

4.3 Discussion

Our goal was exploratory – to investigate a small number of images in order to get a sense of how sensitive performance in PassPoints is to the images used. We found that there were no striking differences in performance, either in the learning phase or the retention phase. As expected, there was a significantly higher number of incorrect password submissions in R2, and input times for incorrect and correct password submissions in R2 were longer. However, there were few significant differences among the images. There were some differences in perceptions of the image groups, with the MURAL group usually more positive.

Our sense of the results is that users can successfully use a variety of images. Nevertheless, we did observe that, although not significant, there was a trend for some images to perform more poorly than others. The POOL image tested most poorly in many of the analyses, whether it be learning, retention, or participant perceptions. A possible explanation is that the POOL image had many more definable objects than, for example, the MURAL image, i.e., more choice and many objects that are very close together, which may have subtly affected memory. The POOL picture also had some large objects and several participants chose the large objects, such as umbrellas, but later were unable to home

in on the correct part of the object. The trend for some images to perform better than others suggests that there are likely to be better and worse images to use as password images. Unfortunately, specific criteria for a "good" image are not known and may only be discovered through research or practical experience.

Clearly, one could find many bad images that should be avoided, for example, images with few memorable click points, such as an image with large expanses of blue sky or jumbled, incomprehensible scenes [3]. Other images that one would want to avoid might be images with little color or low contrast [6]. Abstract images are also likely to be poor password images. Abstract swirls of color were used, apparently successfully, in Déjà Vu [14], but that system was based on image recognition. A swirl of color or other abstraction would probably be a poor image for a system based on clicking specific memorable area in an image. Images that are pleasant and have positive affect may support memorability [8]. Finally, images associated with the individual graphical password user may be memorable, but pose the danger that someone who knows the user would be able to guess the password.

While research from psychology helps, unfortunately limited knowledge about the relationship of image content and memory makes choosing password images an art rather than a science. It appears that many images are probably usable and the main goal should be to avoid bad images that will confound memory. While an image with poor memory characteristics may be acceptable if frequently used, it will probably be quite susceptible to forgetting in infrequent use.



Tips

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2. Pay close attention to spelling, grammar, and punctuation
3. Make sure references are comprehensive and accurate
4. Avoid careless mistakes
5. Read and conform to "Instructions for Authors" or "Submission" section



Book Chapter



Book



The process of writing



The process

- Start early. Very early.
 - Hastily-written papers get rejected.
 - Papers are like fossils: they need time to mature
- Collaborate



Getting help

Get your paper read by as many friends as possible

- Experts are good
- **Non-experts are also very good**
- Each reader can only read your paper for the first time once! So use them carefully
- Explain carefully what you want



Getting expert help

- A good plan: when you think you are done, send the draft to the competition saying "could you help me ensure that I describe your work fairly?".
- Often they will respond with helpful critique (they are interested in the area)
- They are likely to be your referees anyway, so getting their comments or criticism up front is Good.



Listening to your reviewers

Treat every review like gold dust

This is **really, really, really** hard

But it's
really, really, really, really, really, really,
really, really, really, really
important



Listening to your reviewers

- Read every criticism as a positive suggestion for something you could explain more clearly
- DO NOT respond “you stupid person, I meant X”. Fix the paper so that X is apparent even to the stupidest reader.
- Thank them warmly. They have given up their time for you.



Peer Review???

- Science has a system for assessing the quality of research before it is published.
- Peer review means that other scientific experts in the field check research papers for **validity, significance and originality** - and for **clarity**.

If the journal's editor thinks it is suitable for their journal they send the paper to other scientists who research and publish in the same field asking them to:

- Comment on its validity - are the research results credible; are the design and methodology appropriate?
- Judge the significance - is it an important finding?
- Determine its originality - are the results new? Does the paper refer properly to work done by others?
- Give an opinion as to whether the paper should be published, improved or rejected (usually to be submitted elsewhere).

(<http://www.senseaboutscience.org>)



Language and style



Basic stuff

- Submit by the deadline
- Keep to the length restrictions
 - Do not narrow the margins
 - Do not use 6pt font (check templates and Formatting)
 - On occasion, supply supporting evidence (e.g. experimental data, or a written-out proof) in an appendix
- Always use a spell checker



Visual structure

- Give strong visual structure to your paper using
 - sections and sub-sections
 - bullets
 - italics
 - laid-out code
- Find out how to draw pictures and illustrate Tables, and use them

Visual structure

of predefined click regions was relatively small so the password had to be quite long to be secure. Also, the use of pre-defined click objects or regions required simple, artificial images, for example cartoon-like images, instead of complex, real-world scenes [22].

2. PassPoint

In 2005, PassPoint created in order to cover the limitation of Blender Algorithm which was limitation of image. The picture could be any natural picture or painting but at the same time should be rich enough in order to have many possible click points. On the other hand the image is not secret and has no role other than helping the user to remember the click point. Another source of flexibility is that there is no need for artificial predefined click regions with well-marked boundaries like blonder algorithm.

The user is choosing several points on picture in a particular order. In order to log in, the user has to click close to the chosen click points, within some (adjustable) tolerance distance, for example within 0.25 cm from the actual click point [16].

Passpoint system has the potential for extremely high entropy. As any pixel in the image is a candidate for a click point so there are hundreds of possible memorable points in the challenge image. There are several research on the characteristic of this model like predicting probabilities of likely click point which enables predicting the entropy of a click point in a graphical password for a given image [1]. Figure 6 shows a sample of PassPoint password.



Figure 6: A sample of Passpoint method

Lack: Users in PassPoint system were able to easily and quickly create a valid password, but they had more difficulty learning their passwords than alphanumeric users, taking more trials and more time to complete the practice, On the

Figure 7 shows a sample of BDAS algorithm.

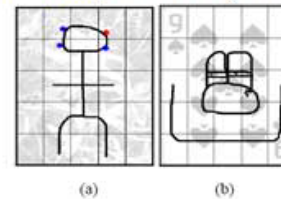


Figure 7: A sample of BDAS algorithm

Lacks: With reference to a research on BDAS, memory decaying over a week is one of the major problems in this algorithm. Users had no problem in recreating it in the five-minute test, but a week later they could not do better than producing the secret password as previous. Also shoulder-surfing and interference between multiple passwords are concerns for BDAS [11].

4. PASSMAP

One of the main problems with passwords is that very good passwords are hard to remember and the one which are easy to remember are too short of simple to be secured. From the studies of human memory, we know that it is relatively easy to remember landmarks on a well-known journey.

As an alternative example we can use a map of Europe and a user who has never been to Europe before should have no problem memorizing that he wants to one day see the Eiffel Tour in Paris, the Big Ben in London and the Kremlin in Moscow and his PassMap might be to visit all of them one at a time flying in from his hometown [19]. Figure 8 will be shows a sample of PassMap password.



Figure 8: A sample of PASSMAP method



Don't Use "We", "You" ,...

YES

It can be seen that...

34 tests were run

These properties were thought
desirable

It might be thought that this
would be a type error

No

We can see that...

We ran 34 tests

We wanted to retain these
properties

You might think this would be a
type error



Use simple, direct language

NO

The object under study was displaced horizontally

On an annual basis

Endeavour to ascertain

It could be considered that the speed of storage reclamation left something to be desired

YES

The ball moved sideways

Yearly

Find out

The garbage collector was really slow



Summary

If you remember nothing else:

- Identify your key idea
- Make your contributions explicit
- Use examples



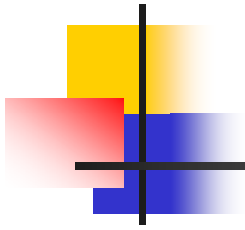
Major reasons for rejection

- **Confirmatory**
 - not novel
 - not complete survey
- **Poor experimental design**
 - Poor controls
 - Hypothesis not adequately tested
- **Inappropriate for Conference or journal**
- **Poorly written**



What makes a good research paper?

- Good science
- Good writing
- Publishing in good Conference
 - Regular Conference
 - Support by Association
 - Support by professional team
 - Indexing and Citation
 - Publishing by
- Publishing in good Journal
 - Indexed by ISI or Scopus
 - Famous publisher such as Elsevier or Springer
 - Impact Factor



*"There is no way to get
experience except
through experience."*