Research Seminar

session 5

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https://www.lri.fr/~anab/teaching/CareerSeminar/

Some info possibly of interest

Today we will start with a presentation
and go to peer feedback in the second half

If you are interested in seeing what is happening in visualization
the IEEE VIS conference is free (http://ieeevis.org/)
starts this Sunday

If you are interested in seeing new HCI technologies
the keynotes for UIST 2020 are streamed / recorded
(https://uist.acm.org/uist2020/program.html#wed)
live stream of closing plenary today at 2pm
Paper presentations (recorded) will appear in 2 weeks

CSCW is also happening now, did not find "free" events, but the recorded presentations may appear soon online (https://cscw.acm.org/)

Resumes & Curriculum Vitae (C.V.)

Resumes and C.V.s

Industry

Resume	1-2 pages

Academia (universities and industrial research)

C.V. (curriculum vitae)	1-n pages

Check for cultural and country differences:

France	photo, birthdate or age
U.S.	no photo, no birthdate or age

Resumes and CVs

Similar but with different emphasis

	Resume	C.V.
Photograph	yes	no
Motivation statement	yes	no
Tailored to position	yes	(no)
Skills (languages, programming)	yes	(no)
Publications	no	yes
Academic diplomas	yes	yes
Employment history	yes	yes
Honors and awards	yes	yes
Chronological order	(no)	yes

What about age, marital status, etc.? Depends on the country.

Categories in your CVs

Typical info in a CV

- Contact info
- Positions held (inverse chronological order)
- Diplomas/education (-//-)
- Awards / Distinctions

- (Teaching experience)
- (Publications)
- (Projects and description)
- (Funding)
- (Skills)

- Service in research, community, etc.
  - conf organization, program committees, reviewing, …

Publications on your C.V.

Each publication should include

- all authors (optional: underline your name)
- full title of paper
- full title of conference or journal
  (If not a paper, specify if it is a poster, demo, etc.)
- specific page numbers or number of pages (book chapter)
- honors if applicable
- ranking of publication (A+, A, B, C)

Maybe a good idea to have a statement about publications in the field (e.g., from Anastasia's C.V.):

In HCI conference proceedings are the preferred publication venue: they are timelier, have higher visibility, require more novelty, and overall have a greater impact than journals. Top tier conferences such as ACM CHI are very selective and have a rigorous review process. Meyer et al. (2009) and Patterson et al. (1999) provide background regarding the role of conference proceedings in experimental Computer Science in general.

Publications on your C.V.

Organize publications into specific categories
DO NOT CHEAT!!

- Referenced International Journals
- Refereed International Conferences
- Refereed National Journals
- Refereed National Conferences
- Books and Book Chapters
- Other publications (demos, posters, magazines...)

Resumes and C.V.s

Create a complete master document
and keep it up to date

Generate specific versions for different purposes
- different lengths,
- some, not all, sections

Honors

Some degrees include honors:

Summa cum laude	Magna cum laude	Cum laude
Highest Honors	High Honors	Honors
Mention très bien	Mention bien	Mention assez bien

Your absolute university ranking can act as an honor (e.g., 1/25)

Technical Writing

History of Scientific Writing

17th century legal system

Defense, prosecution, judge

Scientific review process

Defense:	Author makes a claim
Prosecution:	Reviewers critique that claim
Judge/Jury:	Program committee or editor decides

Writing is a process

Start with your work and analyse it:

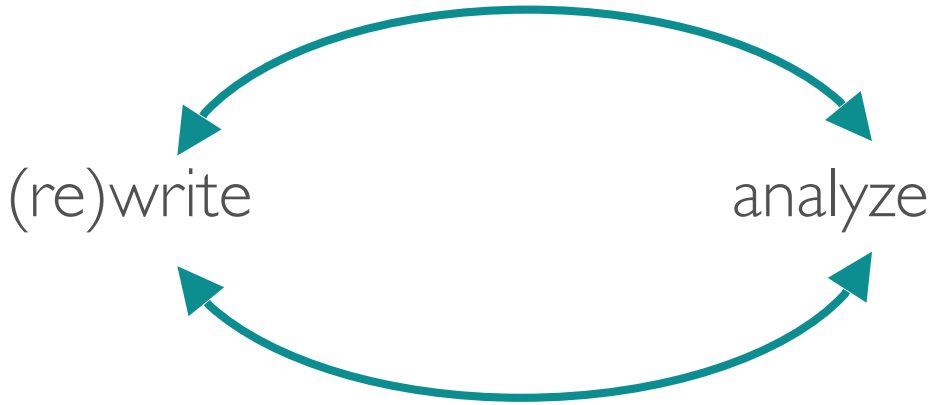
What is new? Surprising? Why?

This is the basis of your claim

Next explain what you did:

How does it justify your claim?

Now iterate :



Writing …

Helps you think:

discover what is important

Should be rigorous:

say what you mean: no more, no less

Requires problem solving

explore different ways to express an idea

Writing = problem-solving

Be careful with what you claim:

- Not too strong (avoid absolutes)
- Not too weak (avoid too much qualification)

Justify your claim:

- What support can you provide?
- How does it relate to other research?
- What is the (potential) impact?

Making claims that justify your work

Why is it difficult?	Mathematics
What was discovered?	Natural Science
What is new?	Design
What is the impact?	Business, applications

Writing = Communicating

If the reader does not understand

the paper will be rejected / the thesis will get a low mark

Read what you write:

Does one idea follow from another?

Does one section lead to the next?

Are the phrases clear and concise?

Is the contribution of the paper clear?

Writing = Communicating

Good writing is not just good grammar or even good style:

A well-written paper reflects
clear thinking

Different audiences = Different styles

Specialists:

- Require precision, detail, rigor
- Assume fundamentals

Non-Specialists:

- Define jargon, provide context
- Refer to details

Non-researchers:

- No jargon, provide overview
- Link to real-world

When writing a scientific document …

What is the problem?

How you frame the problem influences the solution

What is your solution?

Framing the problem well often points to a solution

Why is this problem difficult?

Why haven't others solved it already?

What is your evidence?

Empirical finding
Mathematical algorithm
Real-world impact
Technical advance
Theoretical foundation
Something else?

Questions to answer

What is your research community?

Who has the problem? Who needs the solution?

How does your work compare to existing research?

Who else is addressing the problem?

Why are they different?

Who will benefit from your work?

Users? Researchers? Industry?

What is the potential impact of your work?

Short-term? Long-term?

State your thesis / contribution

One sentence
- What do you believe, based on your work?

One paragraph
- Add the problem definition and context

One page
- Add the justification:
  - empirical, theoretical, technical

How will others cite your thesis?

Can you describe your thesis?

1. Elevator	One-two sentences
2. Cocktail party	3-4 paragraphs
3. Short talk	10 minutes
4. Long talk	30 minutes
5. (PhD Defense)	60 minutes

In each case, you need to communicate
the key point

Authorship and Plagiarism

Authorship

Negotiate authorship as early as possible:

- Author order, who is included
- Who will write what
- Who will edit what, when

Very, very tricky if done late

- Can create life-long enemies…

Different fields, labs have different conventions

- Inclusion: everyone, lab director, only contributors
- Order: alphabetical, lab director, key contributor

Plagiarism

Verbatim or near-verbatim copying or purposely paraphrasing another author's paper

Copying Illustrations or elements without clearing citing source

Verbatim copying of portions of another authors paper with citation but without clearly differentiating what text has been copied

DO NOT DO THIS!

You may cite other researchers

You may quote others explicitly ...

but do not paraphrase or copy other's work

(and don't overdo it with quotes)

Self-Plagiarism

Verbatim or near-verbatim reuse of significant portions of one's own copy-righted work without citing the original source.

... Submitting the same paper to more than one conference or journal

DO NOT DO THIS EITHER!

(rules for % of self-plagarism allowed, software to check)

ACM's Punishment

Informs Department Chair or Dean about the plagiarism

Authors asked to write a formal letter of apology, including an admission of plagiarism

If the paper is in the ACM Digital Library, the paper will be marked with a Notice of Plagiarism and will remove access to text

If paper is under submission, the paper will be automatically rejected

Key Elements of Composition

from:
Strunk & White
"The Elements of Style"

Elements of Style

Strunk & White:

Read it

Read it again!

Key ideas:

Be bold

Use parallel structure

Use active voice

Omit needless words

Elements of Composition

Make the paragraph the unit of composition

Paragraphs:

- Divide a topic into paragraphs to help the reader
- Signal a new step in the development of the topic
- Contain two or more sentences

Paragraphs should support the flow of the article:

- Construct an argument, paragraph by paragraph
- Develop the ideas in a coherent order

Elements of Composition

Hint:

Start with the topic sentences you want to put in a section, then develop the paragraph around it.

Helps with the flow of the section

e.g. of topic sentences for an Introduction section:

large displays are important,
little work done on collaboration when using them,
cannot rely on findings from other surfaces,
our contribution is such a study.

Elements of Composition

(Anastasia's advise)

It helps to write in bullet points the
skeleton of a document or section

Check if this points follow one another logically (flow/story)

These points should then be expanded to paragraphs

… a more complex one …

Elements of Composition

(Anastasia's example, structure of an Introduction)

- G. Lupi and S. Posavec say: be inspired by the patterns and images around us when constructing our visualizations
- This is not aligned with traditional visualization tools that focus on exploration and analysis
- Recent tools (closer to this vision) require drawing skills or are only for vector graphics or specific chart designs
- We use images from around us as design material for data visualizations (inspiration and visualization glyphs)
- We help those not experienced or skilled in digital illustration or visualization, to create expressive visualizations
- Using a unique workflow (semi-guided extraction, data binding, direct manipulation)
- Which we validate by understanding what novices want, proving they can create novel expressive visualizations, showing the expressiveness of tool

DataQuilt: Extracting Visual Elements from Images to Craft Pictorial Visualizations

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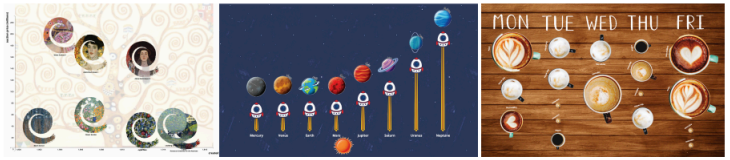

Figure 1. Examples of creations realized with DataQuilt, a new interactive authoring tool that allows authors to borrow visual and stylistic elements from raster images and re-purpose them to create custom, pictorial visualizations. Left: a scatterplot of famous paintings by Klimt, showing the date of creation (x-axis) against how much it was sold for in auction (y-axis). Each data point is a spiral-shaped glyph whose texture is mapped to the painting it represents, whereas the *Tree of Life* painting is used as a decorative background. Middle: a bar chart representing the distance from the sun for the planets of our solar system. Each data point is represented by a space rocket, whose exhaust flames are stretched according to the underlying data. Decorative glyphs (sun, planets) are used for further information and visual appeal. Right: A personal visualization depicting one's coffee intake over a week. The type of coffee (espresso, latte, etc.) is represented by different coffee cups, all extracted from photographs. The orientation of the handle represents the time, whereas size is proportional to the drink size and horizontal position corresponds to the day of the week.

ABSTRACT
Recent years have seen an increasing interest in the authoring and crafting of personal visualizations. Mainstream data analysis and authoring tools lack the flexibility for customization and personalization, whereas tools from the research community either require creativity and drawing skills, or are limited to simple vector graphics. We present DataQuilt, a novel system that enables visualization authors to iteratively design pictorial visualizations as collages. Real images (*e.g.*, paintings, photographs, sketches) act as both inspiration and as a resource of visual elements that can be mapped to data. The creative pipeline involves the semi-guided extraction of relevant elements of an image (arbitrary regions, regular shapes, color palettes, textures) aided by computer vision techniques; the binding of these graphical elements and their features to data in order to create meaningful visualizations; and the iterative refinement of both features and visualizations through direct manipulation. We demonstrate the usability of DataQuilt in a controlled study and its expressiveness through a collection of authored visualizations from a second open-ended study.

Author Keywords
pictorial visualization; creativity; graphic design; collage

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"Did you know that everything you see and like can become design material *for* your data*?"*
— G. Lupi, S. Posavec [26]

INTRODUCTION
Giorgia Lupi and Stefanie Posavec's quote encourages us to be inspired by the patterns and images around us when constructing our visualizations. It is a call to the increasing number of novice visualization enthusiasts that actively engage with their own data, from data collection to visualization authoring [44]. While not necessarily artistically inclined, these casual users seek to craft creative, pleasing, relatable, and memorable visual representations that convey messages and present insights.

However, the needs of such visualization authors are not well aligned with the goals of traditional visualization tools that focus on exploration and analysis [21, 51]. Advanced visualization systems like Tableau [4] support traditional graphs and charts, such as scatterplots and bar charts, but lack flexibility when it comes to crafting creative, custom-made visualizations. Design tools such as sketching or vector graphics editors like Illustrator [1] enable such power but require a certain level of artistic ability and tool expertise to make a realization look compelling. Moreover, maintaining *data integrity* [22] between the graphical elements and the underlying data in such tools is most often a manual process, which is tedious, time consuming, and error prone [7, 8, 24].

Closer to Lupi and Posavec's vision are recent tools from the visualization community for creating custom-made visualizations. Greater expressiveness is achieved through sketch-

DataQuilt, ACM CHI 2020
https://dataquilt.github.io/

Elements of Composition

Begin each paragraph with a topic sentence

The topic sentence states the key idea

Succeeding sentences develop this idea

The final sentence may:

- emphasize the topic
- state an important consequence
- provide a transition to the next section / paragraph

Elements of Composition

Use the active voice

Active voice makes for forcible, lively writing

e.g., Technique X was not preferred => Participants preferred technique Y

Use passive voice to change the rhythm

Avoid making one passive clause depend upon another

e.g., Participants were not allowed to be mobile =>
We prohibited participants from moving.

Avoid using a passive construction as a subject

e.g., Confirmation of these results cannot be obtained.
These results cannot be confirmed

Elements of Composition

Put statements in positive form

Make definite assertions

System X was easier to use than system Y

not

System Y was harder to use than system X

Elements of Composition

Omit needless words, sentences, and paragraphs

The study examined 1 … and 2 …

not

The study was twofold and examined 1 … and then 2 …

Be concise:

Decide what is necessary and omit the rest

Positive statements are more concise
than negative

Elements of Composition

Express co-ordinate/similar ideas in similar form

Parallel structure:

Use the same sentence structure

Do not constantly vary the form

This design ensured low interaction viscosity, consistent performance across participants, and small visual footprint

VS

This design ensured low interaction viscosity, that participants were consistent, and having a small visual footprint

Avoid starting a sentence with a conjunction:

But, And, Not

Elements of Composition

In summaries, keep to one tense

Within a research paper,
keep to one tense within a particular section

Present tense:
Most of the paper,
including abstract, introduction & conclusion

Exception:
Specific results that happened in the past (e.g., in
Related Work, but even there you can use present tense)

Class Discussion

Abstract

Poor abstract example … mid-edit

3D immersive environments make it difficult for users to sense remote virtual objects. We define *teletactics* as the user's experience of manipulating remote objects with haptic feedback. We describe XYZ, a pneumatically powered wrist-worn shape-replicating device that <does what?>

An experiment demonstrated that providing teletactic feedback is equally effective as traditional forms of feedback for providing users with the sensation of actual gestural, direct physical manipulation of remote objects.

Not enough info in some cases – can be compressed further.

Lets fix it … (well, start fixing it)

Enhancing gestural direct manipulation of remote objects with the added feeling of physically grasping is presented and explored. We dub this *teletactics*. The goal is to enhance a user's sense of immersion in the sensation that they are actually physically reaching out and manipulating a remote object, similar to *The Force* from popular film. A pneumatically powered wrist-worn shape-replicating device is presented, as is a number of application scenarios which demonstrate its use. The results of an evaluation of the value of teletactic feedback are also presented, which found this form of feedback to be as important as traditional forms in achieving a sense of actual gestural, direct physical manipulation of remote objects.

Can be compressed further and remove passive voice 🙂.

Lets fix it …

We introduce *teletactics,* a way to enhance the user's sense of immersion in VR environments, by adding the feeling of physically reaching out and grasping remote objects. A pneumatically powered, wrist-worn device replicates the sensation of manipulating a specific shape. In an evaluation of teletactic feedback, we found it to be as important as traditional forms of actual gestural, direct physical manipulation of remote objects. We conclude by discussing a number of application scenarios which demonstrate the use of the newly introduced teletactics.

Abstract

This experiment will determine what will make enzymes effective and what will make them ineffective. We tested different samples of enzymes in a spectrophotometer and recorded their absorption rates. Six samples were placed in the spectrophotometer but two contained no enzyme; these acted as blanks for the other samples. The four remaining samples contained Catecholase ranging from 0.5 ml to 1.75 m. The second half of the experiment contained four test tubes with a constant amount of Catecholase, but the pH levels ranged from four to eight. It was found that if the enzyme was present in large amounts, then the absorption rate was high, and if the pH level ranged from 6 to eight then the absorption rate was high. Therefore it can be said that enzymes work well in neutral pH levels and in large amounts.

University of Richmond, Writing Center

Abstract

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University of Richmond, Writing Center

Abstract reworked

This experiment was performed to determine the factors that positively influence enzyme reaction rates in cellular activities since some enzymes seem to be more effective than others. Catecholase enzyme activity was measured through its absorption rate in a spectrophotometer, using light with a wavelength of 540 nm. We compared the absorbance rates in samples with varying enzyme concentrations and a constant pH of 7, and with samples with constant enzyme concentration and varying pH levels. [. . .] The samples with a pH between six and eight had the greatest absorption rate of 70 percent compared to an absorption rate of 15 percent with a pH of 4; this suggests that Catecholase is most effective in a neutral pH ranging from six to eight.

Can still be improved!!

University of Richmond, Writing Center

Homework Assignment #5:

Write an abstract & citation

Abstract

Provides a concise summary of paper' contributions
(or a thesis/internship contribution)
it is NOT an introduction!

Readers:	1st:	Reviewers (!!)
	2nd:	Non-specialists who won't read paper
	3rd:	Ph.D. students writing a literature review
	4th:	Specialists (maybe)

Goal: Get others to read the paper
Help others cite your paper
Distribute your findings more widely

Abstract

Summarizes the paper:
- Include the problem and solution
- Emphasize the contribution

1st sentence:
- What is the problem?

Next sentences:
- What did you do?: system, algorithm, study
- Key details to explain 1st sentence

Final sentence:
- Main results or claim

Write an Abstract

Pick a new *research* article
Skim, then read the paper

Answer the following questions:
- What is the specific problem that the paper address?
- What research methods did the authors use?
  (interviews? observation? field study? experiment? design a system
- What were their results?

Write your own abstract, based on what you read
DO NOT copy their abstract

Cite the paper

In one sentence, cite the paper as you were referring to it in a research article.

Examples:

The XYZ technique (Smith & Jones, 2012) allows users to ...

Dubois (2014) demonstrated that users require xxx to ...

Assignment #5: Abstract & Citation

Due: before 6th of Nov (ie 23:59 on Nov 5th)

upload to
https://drive.google.com/drive/folders/1KjDbU9Ijx9ShvvHOfFI9h-_UY-uTVsXS?usp=sharing

name your file **LASTNAME_Firstname-A5-AbstractCitation.pdf**

Include:	Their abstract:	copy-paste, with reference
	Your abstract:	4-6 sentences (~150 words)
	Your citation:	1 sentence, with paper reference

Homework

Assignment #2: research notebook

Due: Every week

Create your personal research notebook
- Choose paper, electronic or hybrid

Continue for the rest of the semester …
- Keep track of what you read
- Sketch and record ideas
- DATE every entry
- Add KEYWORDS to every entry

Upload a new entry for us every week !!!

Writing Walkthrough: Procedure

Create a group of authors:

4 people, 20 minutes each = 1 hour 20 minutes

Preparation:

Copy selected document parts (max. 1 page)

Procedure per author

05 min: Everyone reads and annotates text

15 min: Start with sentence one:

proceed line by line: identify problems

Writing Walkthrough: Rules

Constructive criticism:

- Be positive
- Grammatical errors
- Logic errors
- "I did not understand this"

Do not debate: it wastes time!

- Participants identify problems
  - and suggest solutions
- Authors can accept solutions
  - … or not!

Homework

Ask for a Letter of recommendation

Letters of Recommendation

Part I: Write an email request for a letter of recommendation
"Would you be willing to write a strong letter …"

Who are you?
Why are you qualified?
When is it due?
How do they know you?
What is the letter for?
What is the process?

Part II: Write a draft letter for them to edit
Subject: Recommendation for <Who?>, for a <What??

Dear <Name>:

Example

To: mackay@lri.fr
Subject: Letter of Recommendation for Ann SMITH

Dear Professor Mackay:

I hope your semester is going well <something personal, reminder of how you know the professor>.

I have a favor to ask. I have decided to apply to <research program/job/etc> and I hope that you can write me a strong letter of recommendation. <Reminder of what you have done that merits a letter.>

The letter must be <sent to WHO? Uploaded where?> and deadline is <specific date>. I have attached my C.V. <and a quick summary of my more recent work>.

Please let me know if you will be able to write the letter and let me know if you have any questions. Thank you very much.

Best regards,
Ann Smith

Homework (optional)

Write a
Letter of motivation

Optional exercise: Write a letter of motivation

Work in groups of two

Find a (research) lab where you would like to work

Write a two-paragraph letter of motivation:

Why do you want to work in this lab and with whom?
(Ph.D.? internship? research project?)

Why are you a good candidate?
(relevant skills, experience, degrees)

What would you like to do?
(specify a research question and how it relates to their work)