Power Papers

Some Practical Pointers (Part 1)

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Pen mightier than Sword?

Only if you write well

Writing good research papers

Good writing can

Lessen mis-understanding

Increase paper acceptance

Encourage citations

Good writing

Demonstrate your research strength

Emphasize your contribution

Make your work reproducible

Outline

- The problem
- Personal story
- Assumptions
- Books
- Introduction
- Title

Personal story

My Advisor simply said, "Your writing is bad. I don't understand it. Go and revise."

Reviews of my paper

- "Reads very well. The paper is very well written. It starts with a nice overview of different approaches that involve rendering, and the description of the algorithm is clear throughout the paper."

- "Very well written. A pleasure to read."

- "Well-written paper, well situated with respect to previous work and system goals. Nice explanation of system, including usage problems and solutions, including latency."

- "Well written. Small errors that are easy to correct."

Reviews of my paper

- "Yes, very clear; this is a meticulous, well-written paper that was a delight to read; concise and packed with ideas and observations in a step-by-step narrative."
- "Yes, the system is very clearly and thoroughly described."
- "The paper's development of the method is meticulously correct."
- "The paper is well structured and easy to follow."

What I have said

- "I enjoy reading this paper! The English is great, the exposition crystal clear, and the pace is about right (although section 2 could be omitted, or combined with section 3). Kudos to the authors!"
- "Please correct the English. It is very painful to read the paper."
- "The poor English makes understanding difficult in many places. For instance, why are existing methods bad, which the current method is supposed to address? The last few sentences of Section 1 are riddled with bad grammar, making it unintelligible. Without knowing why existing methods are bad, I cannot appreciate the contribution of the proposed method."

A negative example

"In existing biometric watermarking algorithms the cover image is either gray scale face image or fingerprint image, and the watermark data is fingerprint minutiae information or face information or iris codes. The drawback however with these approaches is that by extracting the watermark-object feature template in the client of authentication system. The feature template depend on the server recognize algorithm. In the papers, the fingerprint and face data are captured and processed by image pretreatment. The face image data are inserted as watermarks in the fingerprint image, the client only captures the images information and simply processed, the server can replaced different recognize algorithms to improved performance."

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You agree that writing well is important.
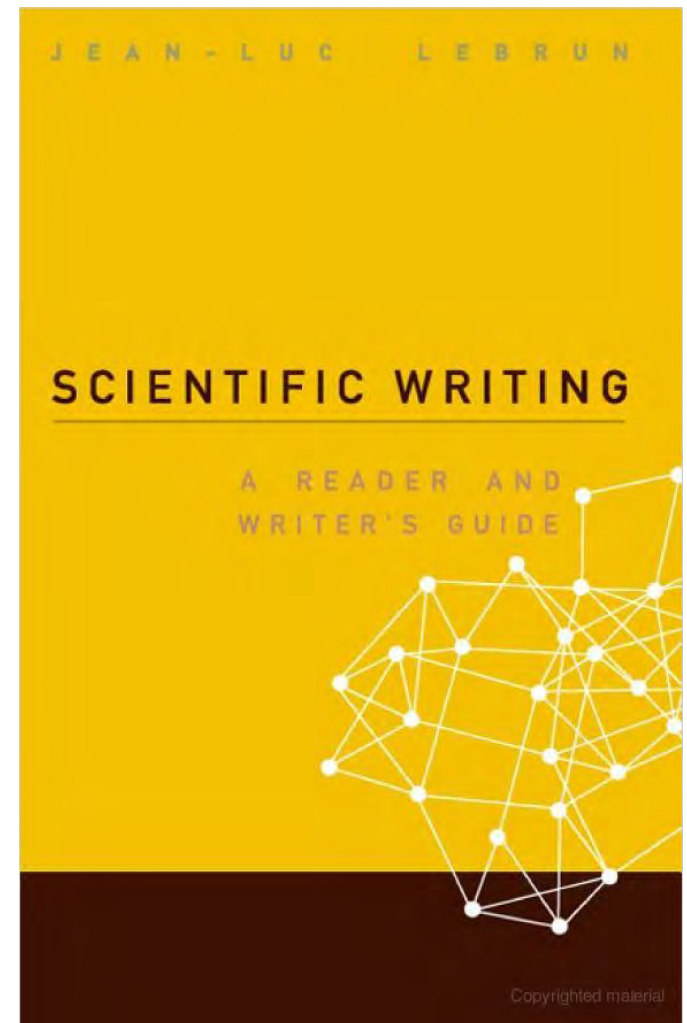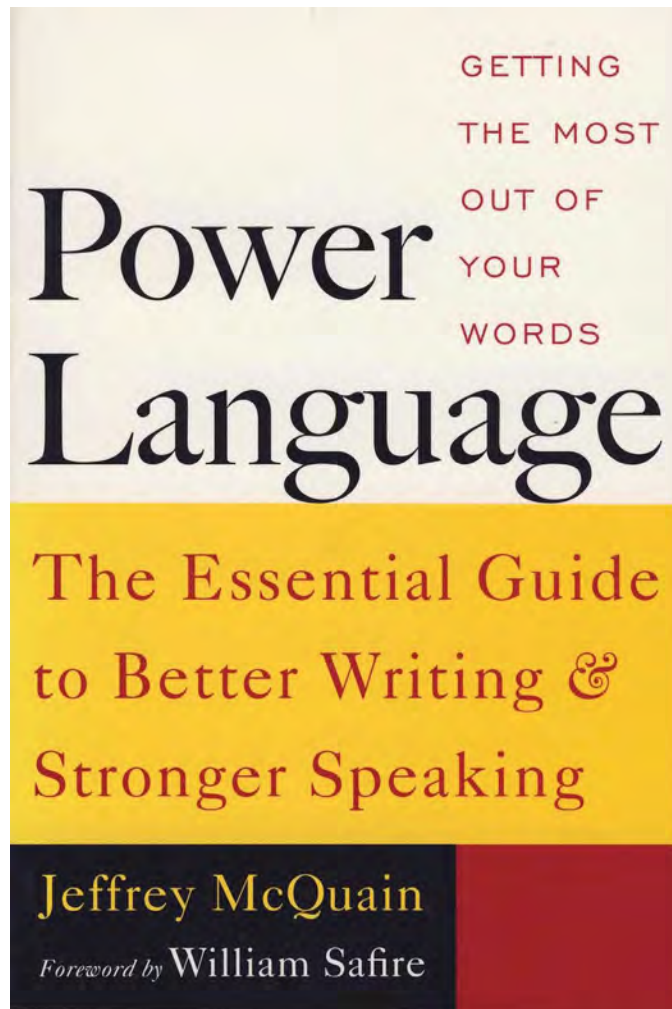
You (can) write grammatically correct sentences.

- Occasional mistakes are ok.

You have good research to write about.

Books

www.scientific-writing.com

GETTING THE MOST OUT OF YOUR WORDS

Power Language

The Essential Guide to Better Writing & Stronger Speaking

Jeffrey McQuain

Foreword by William Safire

JEAN-LUC LEBRUN

SCIENTIFIC WRITING

A READER AND WRITER'S GUIDE

Copyrighted material

Understand the purpose of the Introduction & Title

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Keystroke dynamics has become a popular research area in the field of biometrics recently. Keyboard being the most commonly used input device and the need of very less computing power to analyse keystrokes, Keystroke Dynamics has virtually become the most widely available biometric in many electronic devices ranging from computer terminals, mobile phones to ATM machines. However, most of the research work is done only on fixed-string or otherwise called password hardening approaches [3, 4, 6],. The keystroke authentication is performed during the user-login on a pre-trained string, after which the system resources will be granted to the user.

S.J. Shepherd was the first to investigate on Continuous Keystroke Authentication [1] using mean and the standard deviation of Held Times and Interkey Times. Villani et al., conducted studies on Keystroke Biometric in Long-Text input under Application-Oriented conditions [7]. Keystroke Analysis of Different Languages was conducted by Gunetti et al., [8] which emphasis that Keystrokes can be used as a Biometric in a Language independent setting.

Can a sample of keystroke data identify a user without any constraints on language or application ? Our approach is to identify a person based on presented Keystrokes (not the predetermined set). In this paper, we analyse the usability of Keystrokes dynamics in a general setting. The features we select for identification are the most frequently appearing Sequences appearing in the user's data.

(cont'd)

The rest of the paper we describe the basic concepts behind Keystroke dynamics, the form we represent the learned data, two classifiers for different kind of applications, experimental results and Goodness Measure to measure the quality of the selected sequences.

Keystroke Dynamics is increasingly being used as a biometric for user authentication, no doubt because keyboards are common input devices, being readily found on computers, telephones, ATM machines, etc. By Keystroke Dynamics we mean the temporal typing pattern (the way you type), rather than the content typed (what you type). Most of the research into Keystroke Dynamics, however, is done on fixed-text input, otherwise called password hardening [3,4,6,10], rather than on free text. Typically, keystroke authentication is performed during user login on a pre-determined string, such as the userid or password. This seems to us to be somewhat limiting, considering that most people continue to use the keyboard well beyond user-login. It would certainly be more useful if Keystroke Dynamics can handle free text as well as fixed text.

In our literature search, we note that S.J. Shepherd [1] was perhaps the first to explore using Keystroke Dynamics for continuous authentication, using the rate of typing. The system authenticated the user based only on the mean and standard deviation of the Held Times and the Interkey Times, irrespective of the key being pressed. Although it worked for a user population of four, the accuracy of the system is likely to decrease as the number of users increase. There is no guarantee that these features are sufficiently discriminative. Indeed, our experiments conducted with a larger pool of 22 users confirm this.

(continued in last slides…)

Introductions – necessary?

"I don't usually read introductions. Most of what's in there is repeated verbatim elsewhere in the paper anyway. They are a waste of time. <u>They always say the same thing</u>: the problem is important, everybody else but the author is doing it wrong, and they usually end with a <u>boring</u> table of contents. So, I skip them."
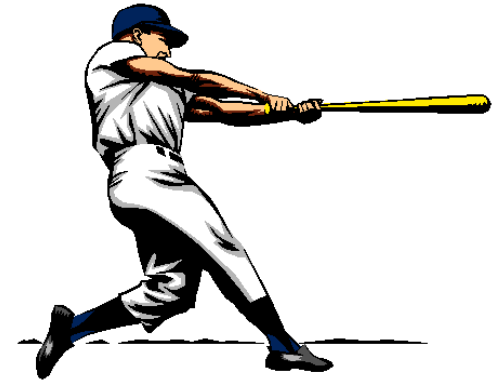
-- Kumar, as quoted by Lebrun

Purpose of the Introduction

is to answer this question in the reader's mind:

"Why should I read the rest of the paper, instead of throwing it away right now?"

3 strikes and you're out!

Title

Abstract

Introduction

Reader is asking you ...

So What?

What are your contributions?

Contributions?

"This paper has two main contributions. First, we develop a particle filter-based approach for tracking the 3D head pose using a statistical facial texture model. Second, we propose a framework for tracking the head pose and the facial animations in real-time using an online appearance model where both the observation and transition models are adaptive. The second contribution extends the concept of OAMs to the case of tracking the non-rigid face motion (3D head pose and facial animation).

This is just a list of work done.

Contributions are

Improvements to the knowledge or methods of science/engineering.

The areas in which your work is better than existing work.
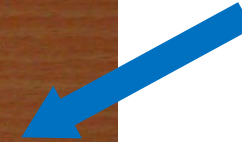
- Your method is faster, cheaper, more robust, etc.

What's the difference?

Your work

Existing work

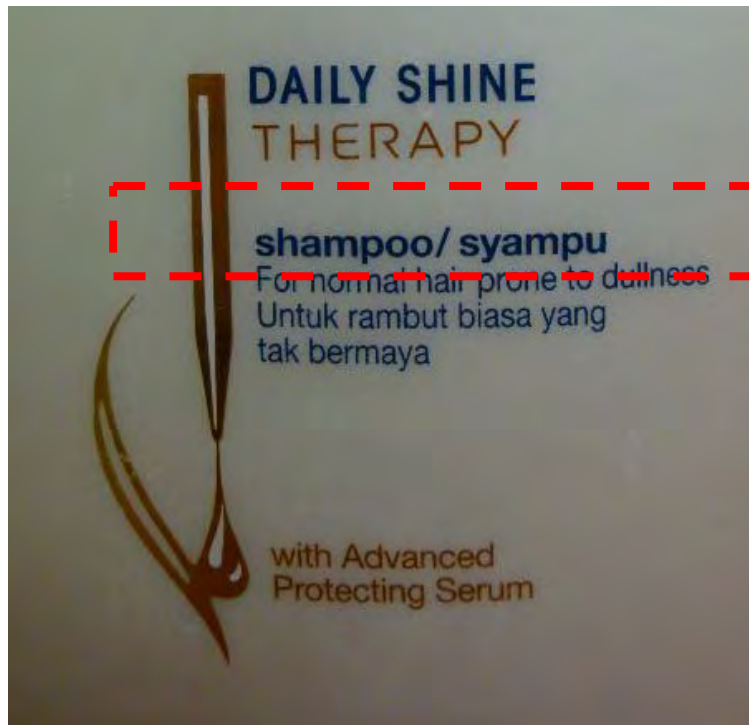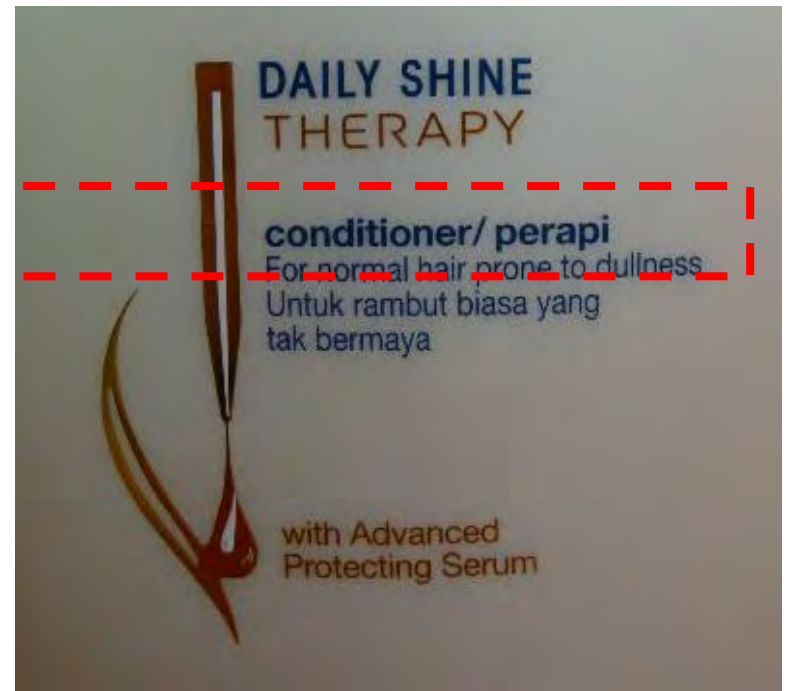# What's the difference?

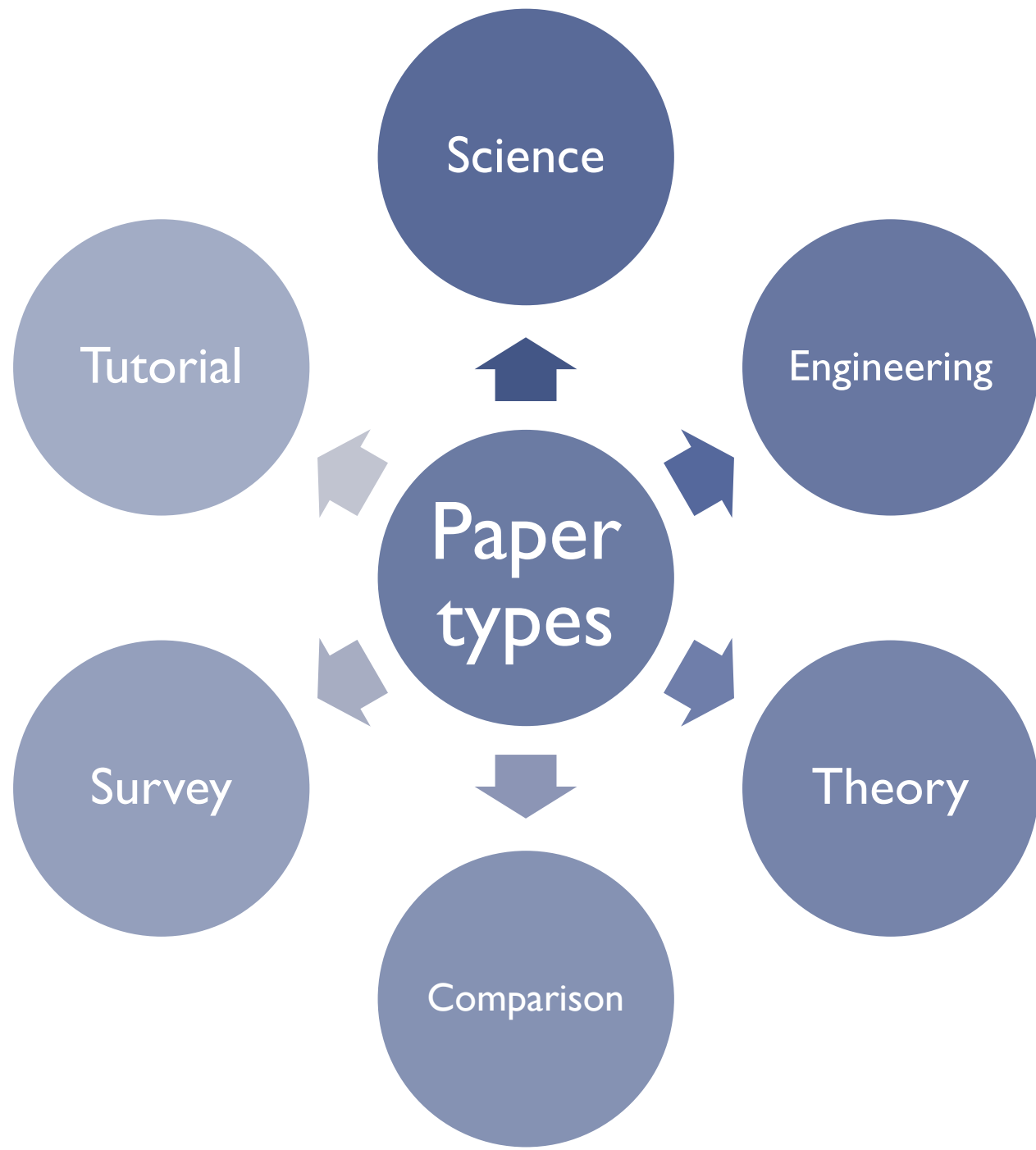Your work

Existing work

What's the difference?

Your work

Existing work

Difference is subtle!

Make differences explicit

Rank	#1 BitDefender Antivirus	#2 Kaspersky Anti-Virus	#3 Webroot AntiVirus with SpySweeper	#4 Norton AntiVirus	#5 ESET Nod32 Antivirus	#6 AVG Anti-Virus	#7 F-Secure Anti-Virus	#8 G DATA AntiVirus	#9 Avira AntiVir	#10 Trend Micro
Threat Detection										
Virus	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Worm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Trojan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Spyware	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Malware	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rootkit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional Protection										
Browser Exploits	✓	✓	✓	✓		✓	✓	✓	✓	
OS Exploits	✓	✓	✓	✓		✓	✓	✓	✓	✓
Keyloggers	✓	✓	✓		✓		✓			✓
Inbound Email Protection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Outbound Email Protection	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Instant Messaging Protection	✓	✓	✓	✓		✓	✓	✓		✓
P2P/File Sharing Protection	✓	✓	✓				✓			
Registry Startup Protection	✓	✓		✓	✓	✓	✓	✓	✓	✓
Dialers	✓	✓	✓	✓	✓		✓	✓	✓	✓
Backdoor	✓	✓		✓	✓		✓	✓	✓	
Hackers	✓	✓	✓	✓		✓	✓	✓		✓
Phishing	✓	✓				✓		✓	✓	
Identity Theft Protection	✓	✓	✓	✓		✓	✓	✓		✓
Adware	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ActiveX	✓	✓	✓	✓	✓		✓		✓	✓
Vulnerabilities	✓	✓		✓	✓		✓			✓
Cookies	✓	✓	✓	✓		✓	✓			✓
Scripts	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Full Web Protection	✓	✓		✓	✓	✓		✓	✓	
Spam			✓							
Auto USB Detect	✓	✓			✓	✓				✓
Protection Technology										
Virus Signatures	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Blacklisting		✓	✓	✓	✓	✓	✓	✓		✓
Whitelisting	✓	✓	✓	✓	✓	✓	✓	✓		✓
Heuristics	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Legend:
- Excellent
- Very Good
- Good
- Fair
- Poor

	Content	Contributions
Science	Discover "natural" laws Test hypothesis Predict outcomes of theories	New theory fits data better New theory predicts behavior more accurately New theory requires fewer assumptions New theory more elegant/general
Engineering	Solve problem Build system Evaluate system performance	New problem solved: no one else could New method requires fewer assumptions, more efficient, more robust, cheaper Limits of system performance revealed
Theory	Prove that something can (not) be done Prove something is unique Prove that 2 methods are (not) equivalent; one is a special case of the other Derive lower (upper) bounds	New insight into nature of problems Uniqueness → once you find it, guaranteed to be the right one Using equivalent method may be more efficient Bounds → this is the best/worst you can do

	Content	Contributions
Comparison	Compare 2 or more methods/theories, analytically or experimentally	Reveals pros/cons of methods/theories Explains when to use which method/theory Explains best choice of parameters
Survey	Compare methods used in the field Summarizes challenges faced	Provides bird's eye view of the field Exposes gaps/inadequacies Reveals trends and directions
Tutorial	Teach a theory/method to a learner Explain how /when to use a technique or equipment	Transfers knowledge/skill Clarifies technical details

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Purpose of the Title

To catch the attention of the reader.

Don't worry about search engines.

Finding Naked People

Margaret M. Fleck[1], David A. Forsyth[2], and Chris Bregler[2]

[1] Department of Computer Science, University of Iowa, Iowa City, IA 52242
[2] Computer Science Division, U.C. Berkeley, Berkeley, CA 94720

Abstract. This paper demonstrates a content-based retrieval strategy that can tell whether there are naked people present in an image. No manual intervention is required. The approach combines color and texture properties to obtain an effective mask for skin regions. The skin mask is shown to be effective for a wide range of shades and colors of skin. These skin regions are then fed to a specialized grouper, which attempts to group a human figure using geometric constraints on human structure. This approach introduces a new view of object recognition, where an object model is an organized collection of grouping hints obtained from a combination of constraints on geometric properties such as the structure of individual parts, and the relationships between parts, and constraints on color and texture. The system is demonstrated to have 60% precision and 52% recall on a test set of 138 uncontrolled images of naked people, mostly obtained from the internet, and 1401 assorted control images, drawn from a wide collection of sources. **Key-**

Qualities of a good Title

Unique

Concise

Clear

Honest

Catchy

Qualities

- Unique
  - Don't copy someone else's title (unless you wish to parody it).
- Concise
  - Prefer short titles to long ones.
  - If adding or removing a word to a title weakens it, then your title is just right.
  - "~~On solving the~~ *face recognition* ~~problem~~ *with one training sample per subject*"

Qualities

- Clear

  ○ *"Web services – an enabling technology for trading partners community virtual integration"*

  ○ *"Web services: integrating virtual communities of trading partners"*

Verbs make the title stronger.

Qualities

- Honest
  - Title sets correct expectations about scope/purpose of paper.
    - Do not over- or under-claim contributions
  - 1st-mover advantage:
    - From *"Local Deformation Profile for Motion-Based Face Recognition"* to

Towards General Motion-Based Face Recognition

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Qualities: Catchy

- Use a question:
  - *"Quo vadis Face Recognition?"*
  - *"Software acceleration using programmable logic: is it worth the effort?"*

> **Are Digraphs Good for Free-Text Keystroke Dynamics?**
>
> Terence Sim   Rajkumar Janakiraman
> School of Computing, National University of Singapore
> 3 Science Drive 2, Singapore 117543

Caveat: your paper should explicitly answer the question!

Catchy titles

- Use an acronym:
  - *"VISOR: learning **VI**sual **S**chemas in neural networks for **O**bject **R**ecognition and scene analysis"*
  - *"StaRSaC: Stable Random Sample Consensus for Parameter Estimation"*
  - *"CRAM: Compact Representation of Actions in Movies"*

- Combine unexpected concepts:
  - *"The diner-waiter pattern in distributed control"*
  - *"Hallucinating faces"*

Catchy titles

- Use alliteration:
  - *"Power papers: some practical pointers"*
  - *"Super Speaking: tricks of the trade"*

- Adapt from famous titles, sayings, poems

Smile, You're on Identity Camera

Ye Ning, Terence Sim
School of Computing, National University of Singapore

Catchy titles

- *"An Eye for an Eye: A Single Camera Gaze-Replacement Method"*

- *"Water, water, everywhere"*

Sex and the City

Lena Edlund*

Columbia University, New York, NY 10027, USA
le93@columbia.edu

Six in the City: Introducing Real Tournament – A Mobile IPv6 Based Context-Aware Multiplayer Game

Keith Mitchell, Duncan McCaffery, George Metaxas and Joe Finney
Distributed Multimedia Research Group
Lancaster University, Lancaster, U.K. LA1 4YR

Guard against sounding arrogant

"A Fundamental Theorem of Stereo"

vs

"A Fundamental Theorem of Stereo?"

A simple question mark can change the perception of the title.

The rookie reporter

- was asked to cover this story: A lunatic man escaped from a mental asylum. He climbed over a fence into a nearby house. A woman, who lived alone, was hanging laundry out to dry in the backyard. The lunatic befriended and seduced her, ate the food in the kitchen, stole some clothes, and ran away.

- The editor gave the reporter one full page of space, so the reporter covered every angle, and took lots of photos. He interviewed the doctors at the asylum, the victim, the neighbors, the police, the lunatic's parents, and even legal experts.

- When he finished his long article, the editor said, "Sorry, please cut to quarter page. President visiting us, so need space for that story.

The rookie reporter

- The reporter went back to his desk and spent a few hours re-writing everything. He managed to squeeze into a quarter of a page.

- But bad news: editor said, "Earthquake just hit our neighboring town. We have to publish that story also. Please cut your article to <u>one photo and one title</u>."

- Reporter pondered long and hard. Finally, he managed to cram the whole story into 5 words.

- What were the 5 words?

Nut screws washer and bolts.

Summary

- Good writing skills can be learned.
  - Practice, practice, practice.
- The Introduction is the most important section of your paper.
  - 3 strikes and you're out!
  - Answers "so what?"
- The Title serves to set your paper apart from others, to catch readers' attention.
  - Unique, concise, clear, honest, catchy