

# Welcome to USC CSCI597!



- This course provides a series of expository lectures to introduce Ph.D. students to the breadth of research topics in CS (and, to some extent, beyond). The idea is to cycle through the subareas of USC research in CS each semester.
- First-year Ph.D. Students are required to enroll for 1 unit of CSCI 597 for the first 2 semesters of the Ph.D. Program. (Applicable only to students enrolling in Summer of 2000 or later.)

# Welcome to USC CSCI597!



- **Lectures:** M 12:00-12:50, OHE-122
- **Office Hours:** M 3-5, HNB-30A
- **Grading:** Must attend all lectures and complete all assignments with satisfactory results.
- **Enrollment:** First-year Ph.D. Students are required to enroll for 1 unit of CSCI 597 for the first 2 semesters of the Ph.D. Program.
- **Web site:** <http://iLab.usc.edu/classes/2004cs597s/>

## More on grading / assignments



- **In the first 5 minutes of each lecture:** short 5-minute quiz about the contents of the previous lecture.
- Paper will be provided, but **bring a pen or pencil.**
  - Questions will be easy, but...
  - You must be **present**, and
  - **On time!**
- Quizzes will be collected immediately at the end of the 5-minute period.
- There will be no opportunity for submitting late quizzes.

## More on grading / assignments



- Each quiz graded on a scale
  - From 0 (not turned in, no answer, all wrong answers, ...)
  - To 5 (all correct answers)
- To pass you will need to get a cumulative grade of **3n or more**, where **n** is the number of assignments handed out during the semester.

# Ethical Issues



- Plagiarism: **CAUTION!**
- Evident plagiarism will result in failing a class and **filing with student conduct.**

# Ethical Issues



- What is plagiarism?

Using others' work and misrepresenting it as being your own.

This includes:

- Cut & paste from the reading assignment
- Cut & paste from the web
- Cut & paste from books, other papers, etc.
- Cut & paste from **ANYTHING** that is not your own!
- Changing wording of a sentence but keeping the ideas
- Summary which does not include proper references
- Etc.

# Ethical issues



This and the following slides are from:

[http://www.usc.edu/student-affairs/student-conduct/ug\\_plag.htm](http://www.usc.edu/student-affairs/student-conduct/ug_plag.htm)

*"Plagiarism is the unacknowledged and inappropriate use of the ideas or wording of another writer."*

As defined in the University Student Conduct Code (published in the current SCampus), plagiarism includes:

*"The submission of material authored by another person but represented as the student's own work, whether that material is paraphrased or copied in verbatim or near verbatim form;"*

*"The submission of material subjected to editorial revision by another person that results in substantive changes in content or major alteration of writing style;" and*

*"Improper acknowledgment of sources in essays or papers." (§11.11)*

## Example 1: Repeating Another's Words Without Acknowledgment



**Original Source** (From Neil Postman. *Amusing Ourselves to Death*. New York: Penguin, 1985. 127-128.)

“The television commercial is the most peculiar and pervasive form of communication to issue forth from the electric plug....The move away from the use of propositions in commercial advertising began at the end of the nineteenth century. But it was not until the 1950's that the television commercial made linguistic discourse obsolete as the basis for product decisions. By substituting images for claims, the pictorial commercial made emotional appeal, not tests of truth, the basis of consumer decisions.”

## Example 1: Repeating Another's Words Without Acknowledgment



### Plagiarized Version (*essentially verbatim*):

"Television commercials have made language obsolete as a basis for making decisions about products. The pictorial commercial has substituted images for claims and thereby made emotional appeal, rather than tests of truth, the basis of consumer decisions."

# Example 1: Repeating Another's Words Without Acknowledgment



## Plagiarized Version (*essentially verbatim*):

“Television commercials have made language obsolete as a basis for making decisions about products. The pictorial commercial has substituted images for claims and thereby made emotional appeal, rather than tests of truth, the basis of consumer decisions.”

*Although the writer has changed, rearranged, and deleted words in the version above, the text is essentially the same as the original source. In paraphrasing, you take the writer's ideas and put them in your own words. It is **not** a process of substituting synonyms or rearranging the order of words. Even if the version above gave credit to Postman for his ideas, the passage would be considered plagiarized.*

## Example 1: Repeating Another's Words Without Acknowledgment



### Correctly Paraphrased and Documented Version:

"Postman argues that television commercials do not use language or "test of truth" to help viewers decide whether to buy a product. Instead, they rely on images to create an emotional appeal that influences consumers' decisions (127-128)."

# Example 1: Repeating Another's Words Without Acknowledgment



## Correctly Paraphrased and Documented Version:

"Postman argues that television commercials do not use language or "test of truth" to help viewers decide whether to buy a product. Instead, they rely on images to create an emotional appeal that influences consumers' decisions (127-128)."

*In the correctly paraphrased and documented version above, **most of the ideas** have been paraphrased or restated in the writer's own words. Quotation marks have been placed around a key phrase that is taken directly from the original source. In addition, the name of the author refers readers to a corresponding entry in the Works Cited page, and the page number indicates the location of the information in the source cited.*

## Example 2: Presenting Another Writer's Argument or Point of View Without Acknowledgment

**Original Source** (From Arlene Skolnick. *Embattled Paradise*. New York: Basic Books, 1991. 11.):

"The changes in larger society, as well as their reverberations in the family, call into question basic assumptions about the nature of American society, its family arrangements, and Americans themselves. A "Cultural struggle" ensues as people debate the meaning of change. One of these periods of cultural upheaval occurred in the early decades of the nineteenth century; a second occurred in the decades just before and after the turn of the twentieth century. For the last thirty years, we have been living through another such wave of social change.

Three related structural changes seem to have set the current cycle of family change in motion: first, the shift into a "postindustrial" information and service economy; second, a demographic revolution that not only created mass longevity but reshaped the individual and family life course, creating life stages and circumstances unknown to earlier generations; third, a process I call "psychological gentrification," which involves an introspective approach to experience, a greater sense of one's own individuality and subjectivity, a concern with self-fulfillment and self-development. This is the change misdiagnosed as narcissism."

## Example 2: Presenting Another Writer's Argument or Point of View Without Acknowledgment



### Plagiarized Version:

“Three periods of cultural upheaval in the nineteenth and twentieth centuries have caused major changes in American society. The first occurred during the beginning of the nineteenth century, the second during the decades before and after 1900, and the third has been underway for the last thirty years. Three structural changes occurring during the current upheaval are primarily responsible for changes in American families. These include the development of a postindustrial information and service economy , demographics changes (including longer life spans that have created new and different life stages), and an increased sense of individuality including a desire for self-fulfillment and self development.”

## Example 2: Presenting Another Writer's Argument or Point of View Without Acknowledgment



### Plagiarized Version:

“Three periods of cultural upheaval in the nineteenth and twentieth centuries have caused major changes in American society. The first occurred during the beginning of the nineteenth century, the second during the decades before and after 1900, and the third has been underway for the last thirty years. Three structural changes occurring during the current upheaval are primarily responsible for changes in American families. These include the development of a postindustrial information and service economy , demographics changes (including longer life spans that have created new and different life stages), and an increased sense of individuality including a desire for self-fulfillment and self development.”

*The writer of the passage above correctly paraphrases Skolnick's ideas but does not give her credit for her ideas or line of argument. The version on the next slide eliminates the plagiarism by attributing the ideas to Skolnick.*

## Example 2: Presenting Another Writer's Argument or Point of View Without Acknowledgment



### Correctly Documented Version

“According to Skolnick, three periods of cultural upheaval in the nineteenth and twentieth centuries have caused major changes in American society. The first occurred during the beginning of the nineteenth century, the second during the decades before and after 1900, and the third has been underway for the last thirty years. Three structural changes occurring during the current upheaval are primarily responsible for changes in American families. These include the development of a postindustrial information and service economy, demographics changes (including longer life spans that have created new and different life stages), and an increased sense of individuality including a desire for self-fulfillment and self development (11).”

## Example 2: Presenting Another Writer's Argument or Point of View Without Acknowledgment



### Correctly Documented Version

"According to Skolnick, three periods of cultural upheaval in the nineteenth and twentieth centuries have caused major changes in American society. The first occurred during the beginning of the nineteenth century, the second during the decades before and after 1900, and the third has been underway for the last thirty years. Three structural changes occurring during the current upheaval are primarily responsible for changes in American families. These include the development of a postindustrial information and service economy, demographics changes (including longer life spans that have created new and different life stages), and an increased sense of individuality including a desire for self-fulfillment and self development (11)."

*In the version above, a reader would be able to locate the source by finding the title of Skolnick's book in the Works Cited page and looking on page 11, the number indicated at the end of the paragraph.*

## Example 3: Repeating Another Writer's Particularly Apt Phrase or Term Without Acknowledgment



**Original Source** (From Arlene Skolnick. *Embattled Paradise*. New York: Basic Books, 1991. 11.)

“Three related structural changes seem to have set the current cycle of family change in motion: first, the shift into a “postindustrial” information and service economy; second, a demographic revolution that not only created mass longevity but reshaped the individual and family life course, creating life stages and circumstances unknown to early generations; third, a process I call “psychological gentrification,” which involves an introspective approach to experience, a greater sense of one's own individuality and subjectivity, a concern with self-fulfillment and self-development. This is the change misdiagnosed as narcissism.”

## **Example 3: Repeating Another Writer's Particularly Apt Phrase or Term Without Acknowledgment**



### **Plagiarized Version**

The large number of "self-help" books published each year attest to Americans' concern with self-improvement and achieving more fulfilling lives. This process might be described as "psychological gentrification."

### **Correctly Documented Version**

The large number of self-help books published each year attest to Americans' concern with self-improvement and their desire to have a more fulfilling life. Skolnick labels this process as "psychological gentrification" (11).

## Example 3: Repeating Another Writer's Particularly Apt Phrase or Term Without Acknowledgment

### Plagiarized Version

The large number of "self-help" books published each year attest to Americans' concern with self-improvement and achieving more fulfilling lives. This process might be described as "psychological gentrification."

### Correctly Documented Version

The large number of self-help books published each year attest to Americans' concern with self-improvement and their desire to have a more fulfilling life. Skolnick labels this process as "psychological gentrification" (11).

*As the example above illustrates, putting quotation marks around a borrowed word or phrase is not sufficient documentation. You must also acknowledge the author and give the page numbers so a reader would be able to consult the original source and locate the word or phrase. In the original source, Skolnick takes credit ("a process I call") for coining the term "psychological gentrification." Quotation marks in the original appear to be used for emphasis. Phrases in quotations should be cited unless they have become common usage (e.g., "postindustrial" in the original source above).*

## Remember...



- When you write a paper, you'll remember all nice phrases you come up with. This applies to others too!
- Professors can "feel" plagiarism very easily
- Professors often conduct extensive searches to check for plagiarism
- Professors are likely to know or have seen the material you come across when writing a class paper

So... yes, do research and find material that can help you writing your essay. But do not plagiarize that material!

## Regarding scientific papers...



- Readers and reviewers need to know that you are honest and that you have a good command of the literature
- So... plagiarism just does not make sense!
- Indeed, if you write:

“Neurons in the early visual system respond to contrast between two regions in the visual field rather than to the absolute amount of light stimulation in a single region.”
- You will make a weaker point than

“The pioneering work of Kuffler (1953) and Hubel & Wiesel (1962) has clearly demonstrated that neurons in the early visual system ...”

## So, don't be shy about citing others!



- **WEAK:** "There has been some research about autonomous robots, but mostly confined to indoors environments."
- **STRONG:** "A recent review by DeSouza & Kak (2002) suggests that autonomous robot research has been mostly confined to indoors environments."

And remember that a lot of what you know stems from what you have read!

- **WEAK:** Try to explain why previous research does not work, hence your new work was required.
- **STRONG:** Show how previous research has established a basis for your new work.

## For additional information



- SCampus
- <http://www.usc.edu/student-affairs/student-conduct/>
- **Office for Student Conduct**  
**FIG-107**  
**740-6666**
- Google search for “plagiarism,” etc.

# Ph.D. Research



- How to read papers?
- How to keep up-to-date with research?
- How to determine novelty of an idea?
- How to write papers?

## A typical weak paper



- **Short and naïve introduction** – demonstrates lack of background research and of expertise from the authors
- **Methods / algorithms not very original** – demonstrates lack of understanding of the state-of-the-art in the field
- **Results show operation of system on one example case** – lack of systematic study demonstrates laziness and greatly reduces belief that research described is generally applicable
- **Short discussion limited to own research rather than putting work into perspective by comparing to previous studies** – shows lack of knowledge of others' work and reduces credibility

## A typical weak paper: summary



A weak paper is one where the authors describe work that is not very new, is not thoroughly validated, and is not properly placed in perspective with respect to previous work.

Mostly, it is weak because... the **authors have been lazy** and have not done proper background research.

## A typical strong paper



- **Comprehensive expert introduction** – demonstrates extensive background research, mastery of the whole field, understanding of the important issues, and clear positioning of the research as new
- **Methods / algorithms are original** – demonstrates good understanding of the state-of-the-art in the field, and expertise
- **Results include thorough quantitative validation** – the authors seriously stand behind their research and make efforts to prove how it is new / different / better
- **Discussion puts work into perspective by comparing to previous studies** – shows expertise and credibility by not being shy about comparing to other research

## A typical strong paper: summary



A strong paper is one where the authors demonstrate that they have complete expert understanding of the major open research issues in the field, and where they provide a convincing argument that they just professionally cleaned up one of those issues.

Mostly, it is strong because **the authors know what they are doing!**  
**And because they worked extremely hard on their research.**

# Introduction; Originality



- Your paper needs to bring something new;
- But research is nowadays a very active field, and chances are that something very similar to your contribution has already been proposed 20 years ago.
- Again, don't try to mask that fact, hoping that reviewers will be ignorant. On the contrary, use extensive literature research to frame your work comparatively to previous studies.
- It's ok to write:
  - "XXX et al. (1972) have proposed [...], an idea which we here sought to further explore..."
  - "Our approach is related to that of YYY et al. (1995), ..."
  - "We follow the hypothesis of ZZZ et al. (1938) and investigate ..."

# Discussion



- Don't try to hide weaknesses; readers and especially reviewers are not naïve and will explicitly ask you about those weaknesses if you don't appropriately discuss them – in the end, you just waste time.
- It's ok to have in your discussion statements like:
  - “a clear limitation of our approach is that in its present form it cannot ...”
  - “our study does not address the problem of...”
  - “better methods have been proposed for [component X] of our system ...”
- **Just be honest, fair, objective.**

# How to read papers



- Be focused
- Use google and books extensively
- Start with reviews and book chapters, then go on with topical research as you are already more familiar with the field
- Be critical – learn to identify weak papers

Read as much as you can. You want to become *the world expert* in your research domain.

# How to keep up-to-date with research



- Check online journals regularly
  - Check online search engines regularly
  - Go to conferences
  - Go to USC/UCLA/Caltech/other research seminars
  - Talk with people – identify key researchers in your topic, then meet with them when they come over to USC for a talk
  - Check conference web sites
  - Check lab web sites
- 
- You may want to ask your advisor to consider the JournalTracker service of ISI: sends you an email with the table of content for each new issue of a set of monitored journals.

see <http://iLab.usc.edu/jtrack/>

## Medline / PubMed



- <http://www.ncbi.nlm.nih.gov/entrez/>
- Created by NIH
- Moderated (selected journals, some degree of human checking)
- Mostly for the biological sciences
- Increasingly, provides links to PDF versions of papers in a growing subset of the journals covered

Entrez-PubMed - Microsoft Internet Explorer

Address <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi>

NCBI PubMed National Library of Medicine NLM

PubMed Nucleotide Protein Genome Structure PMC Taxonomy OMIM Books

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- Clinical Alerts
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- PubMed Central

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PubMed, a service of the National Library of Medicine, provides access to over 12 million MEDLINE citations back to the mid-1960's and additional life science journals. PubMed includes links to many sites providing full text articles and other related resources.

**Bookshelf Additions**

 *The KIR Gene Cluster*, written by Mary Carrington and Paul Norman, is now available for interactive searching on the [Bookshelf](#).

**New PubMed Features**

 The Summary page displays a new icon link for free full-text articles.

New data and additional search options, including an [e-mail](#) selection, have been added to PubMed. See [New/Noteworthy](#).

**Severe Acute Respiratory Syndrome**

Citations to articles about [Severe Acute Respiratory Syndrome](#) (SARS) are provided during this time of peak interest to facilitate searching this topic.

Done Internet

Entrez-PubMed - Microsoft Internet Explorer

Address <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?CMD=Search&DB=PubMed>

NCBI PubMed National Library of Medicine NLM

PubMed Nucleotide Protein Genome Structure PMC Taxonomy OMIM Books

Search PubMed for visual attention Go Clear

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Display Summary Show: 20 Sort Send to Text

Items 1-20 of 14035 Page 1 of 702 Next

1: [Bigelow AE](#) [Related Articles, Links](#)  
 The development of joint attention in blind infants.  
 Dev Psychopathol. 2003 Spring;15(2):259-75.  
 PMID: 12931827 [PubMed - in process]

2: [Gosselin F, Schyns PG](#) [Related Articles, Links](#)  
 Superstitious perceptions reveal properties of internal representations.  
 Psychol Sci. 2003 Sep;14(5):505-9.  
 PMID: 12930484 [PubMed - in process]

3: [VanMarle K, Scholl BJ](#) [Related Articles, Links](#)  
 Attentive tracking of objects versus substances.  
 Psychol Sci. 2003 Sep;14(5):498-504.  
 PMID: 12930483 [PubMed - in process]

4: [Grant ER, Spivey MJ](#) [Related Articles, Links](#)  
 Eye movements and problem solving.  
 Psychol Sci. 2003 Sep;14(5):462-6.  
 PMID: 12930477 [PubMed - in process]

5: [Abrams RA, Christ SE](#) [Related Articles, Links](#)  
 Motion onset captures attention.  
 Psychol Sci. 2003 Sep;14(5):427-32.  
 PMID: 12930472 [PubMed - in process]

6: [Bonfond A, Rohmer O, Hoefft A, Muzet A, Tassi P](#) [Related Articles, Links](#)  
 Interaction of age with time of day and mental load in different cognitive tasks.

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Address http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list\_uids=12930472&dopt=Abstract

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PubMed Nucleotide Protein Genome Structure PMC Taxonomy OMIM Books

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1: Psychol Sci. 2003 Sep;14(5):427-32. [Related Articles, Links](#)

**Motion onset captures attention.**

Abrams RA, Christ SE.

Washington University.

Although visual motion may seem salient, motion per se does not automatically attract attention. We show here, however, that the onset of motion does indeed attract attention. In three experiments, subjects identified target letters in displays that contained targets and distractors. There was no advantage for moving letters among static ones, but there was an advantage for objects that had recently started to move despite the fact that the motion was uninformative. If some additional time was allowed to elapse after motion onset, inhibition of return slowed responding to the item that had started to move—a further sign that the motion onset had captured attention. Finally, detection of target letters was found to be independent of the number of distractors in the display if the target had undergone motion onset, also indicative of attentional capture. We discuss the adaptive significance of sensitivity to onsets in the presence of a relative insensitivity to ongoing motion.

PMID: 12930472 [PubMed - in process]

Display Abstract Show: 20 Sort Send to Text

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## Getting the bibliography record



- Try the tools we have developed at <http://iLab.usc.edu/bibTOhtml/>

- **Example:**

`medkey visual attention`

lists papers matching the keywords

`medref visual attention >> mybib.bib`

grabs the medline records, convert to bibtex,  
add to end of local bibliography file

iLab - University of Southern California - Microsoft Internet Explorer

File Edit View Favorites Tools Help Address <http://ilab.usc.edu/bibTOhtml/>

Google



University of Southern California  
Hedco Neuroscience Building  
Los Angeles, CA 90089-2520 - USA

### med2bib - Convert Medline to BibTeX

**med2bib** converts MEDLINE full-record ASCII bibliographic entries for journal articles into BibTeX entries. **toc2bib** converts TOC/DOC (the electronic literature search engine available at Caltech) full-record entries.

All entries from your medline file or tocdoc file are parsed, converted into BibTeX fields, and appended to the end of your bibtex file (no checking is done as to the nature of the bibtex file).

A key is automatically generated for each entry. It is used in `\cite{key}` commands in LaTeX files, to cite the entry. Key generation rules are:

- if one author, year YY: AuthorYY (e.g., Wilson80)
- if 2 authors, year YY: Author1\_Author2YY (e.g., Hubel\_Wiesel62)
- if more than 2 authors: Author1\_etalYY (e.g., Koch\_etal96)

For each entry processed, a citation in short-hand format is output to stderr, so that you can check for progress and bugs.

No checking for duplicate keys is done. Only article BibTeX entries are generated, with fields: author, title, journal (abbreviated in MEDLINE but not in TOC/DOC), volume, number, pages, month (MEDLINE only), year, abstract, keyword (separated by |), address, note (contains MEDLINE notes (e.g., publication of an erratum) and language if not English).

**NEW IN VERSION 1.03 [2 Aug 2000]:** Medline page numbers corrected to long format (e.g., 1234-1256 instead of 1234-56) and added script "medref" to automatically query pubmed and convert results. Contributed by Olav Kongas ([kongas@ioc.ee](mailto:kongas@ioc.ee)) and Marko Vendelin ([markov@ioc.ee](mailto:markov@ioc.ee)).

Download [med2bib-1.03.tar.gz](#)

**NEW IN VERSION 1.04 [14 May 2002]:** Bugfix of Medline page numbers when article has only one page. Contributed by Stephan Imfeld ([imfeld@geo.unizh.ch](mailto:imfeld@geo.unizh.ch)).

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# ISI Web of Knowledge



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### Easy Search Results--Summary

TS=visual attention  
*Database(s)=SCI-EXPANDED, SSCI, A&HCI; Timespan=1975-2003; (sorted by latest date)*

SUBMIT MARKS MARK PAGE MARK ALL

#### Results Page 1 (Articles 1 -- 10):

« « [ 1 | 2 ... » » »

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Use the checkboxes to add individual articles to the Marked List. Be sure to click SUBMIT MARKS button before leaving page.

- Zorzi M, Mapelli D, Rusconi E, et al.  
[Automatic spatial coding of perceived gaze direction is revealed by the Simon effect](#)  
PSYCHON B REV 10 (2): 423-429 JUN 2003
- Reppa I, Leek EC  
[The modulation of inhibition of return by object-internal structure: Implications for theories of object-based attentional selection](#)  
PSYCHON B REV 10 (2): 493-502 JUN 2003
- Giesbrecht B, Woldorff MG, Song AW, et al.  
[Neural mechanisms of top-down control during spatial and feature attention](#)  
NEUROIMAGE 19 (3): 496-512 JUL 2003
- Manjaly ZM, Marshall JC, Stephan KE, et al.  
[In search of the hidden: an fMRI study with implications for the study of patients with autism and with acquired brain injury](#)  
NEUROIMAGE 19 (3): 674-683 JUL 2003
- Ho AK, Manly T, Nestor PJ, et al.  
[A case of unilateral neglect in Huntington's disease](#)

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Address http://isi5.newisiknowledge.com/portal.cgi?DestApp=WOS&Func=Frame

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**Easy Search Results--Full Record**

Article 1 of 2482 NEXT SUMMARY MARK

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**Automatic spatial coding of perceived gaze direction is revealed by the Simon effect**  
Zorzi M, Mapelli D, Rusconi E, Umiltà C  
PSYCHONOMIC BULLETIN & REVIEW  
10 (2): 423-429 JUN 2003

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**Abstract:**  
In a typical Simon task, the (irrelevant) spatial position of the stimulus interferes with the processing of the salient characteristic (e.g., color). We used the Simon effect to investigate the automatic processing of gaze cues. We show that a simple drawing of schematic eyes automatically generates a spatially defined code of gaze direction. Although completely irrelevant to the task, direction of gaze influenced reaction times in a spatially selective two-choice discrimination based on eye color. Moreover, in one experiment employing an orthogonal manipulation of stimulus position and gaze direction, we found that coding of gaze direction is independent of stimulus spatial coding. Our finding of a "gaze-direction Simon effect" is congruent with the hypothesis that gaze direction is coded by a specialized mechanism.

**KeyWords Plus:**  
SOCIAL ATTENTION, HEAD ORIENTATION, VISUAL-ATTENTION, EYE GAZE, PERCEPTION, CUES, INFORMATION, MECHANISMS, STIMULUS, MINDS

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observed to change their sensitivities by **visual attention** (Motter 1993)It is computationally  
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given moment. This is based on the idea that **visual attention** is influenced by external events such as  
information from memory [8]Clearly, **visual attention** is influenced by external stimuli, such as  
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. 29 3.5 **Visual Attention** Tracking .  
describes a simple technique to recognize the **visual attention** of the primary agent. Section 3.6 presents  
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an autonomous robot needs to change its **visual attention**. The robot, generally, has a single vision  
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that the results could be used for guiding **visual attention** and for providing side information to  
can be used as an interest operator to guide **visual attention**. Di Gesu and Valenti [14] suggested an  
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Hector Yee, Sumanta Pattanaik, Donald P. Greenberg  
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**Abstract:** INTRODUCTION Global illumination is the physically accurate calculation of lighting in an environment. It is computationally expensive for static environments and even more so for dynamic environments. Not only are many images required for an animation, but the calculation involved increases with the presence of moving objects. In static environments, global illumination algorithms can precompute a lighting solution and reuse it whenever the viewpoint changes, but in dynamic environments, any... [\(Update\)](#)

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...flexibility in choice of error metrics. **For example, our system can support viewdependent perceptual error metrics similar to [RPG99, YPG01, DPF01] 4.3.2** Sampling the priority map The patch priorities can be thought of as the likelihood of error in the value of a pixel...

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