Critical Reviews of Research and Scholarly Papers

Guidelines

Overview

I would like you to hand in five short (500-word), critical evaluations of a published research or scholarly paper that deals primarily with deep learning methods applied to geospatial data. Try to avoid conference papers or pre-print articles from an archive service.

Each review must have the follow components:

A correct bibliographic citation at the top of the page, which must follow the format of Author, (year). Title, journal (underline the name or use italics), volume and page numbers, in that order. If there is a journal issue, it should be in parenthesis after the volume. This is an example:

> Hook, S. J., Gabell, A. R., Green, A. A. and Kealy, P. S., (1992). A comparison of techniques for extracting emissivity information from thermal infrared data for geologic studies. *Remote Sensing of Environment,* **42**(2), 123 - 135.

See additional instructions on format below.

A 400-word description of the article and any key points of interest. This should be a critical analysis in which you think about the larger issues involved.

A 100-word personal evaluation where you explain how the paper relates to your interest, comment on the significance of the results, and any personal reaction you have to it. A comment such as "I could not understand this paper" is not acceptable - you should skim the paper before you decide to review it, to ensure that you can get the basic gist of it. If you cannot understand the paper you should report on a different paper and not that one.

Your review will be graded on quality of the review and your overall presentation. I expect the work to be well-edited and polished.

Language Style

Your review should use standard scientific language. Scientific language is formal, but not overly stylized or convoluted. Avoid colloquialisms (slang or informal speech). Check your spelling. Make sure each sentence is a complete sentence, and has a verb. Review the structure of your paragraphs – the ideas should flow logically. It is a good habit to proofread your work a day later, checking for mistakes. The main description of the article should be dispassionate.

Important: Plagiarism

Now that many journals are available on-line it is possible to actually copy directly from the paper using cut-and-paste. This is cheating. You must use your own words throughout your review. If you do quote, use quotation marks, followed by an appropriate citation (author, year: page number). For example:

It has been asserted that high resolution imagery, “is particularly useful for spatial analysis, but of limited value for spectral analysis.” (Jones, 2002: 438).

However, I would strongly urge you to try not to quote if possible – it is much better to use your own words. The norm in scientific scholarly papers is not to use quotations, but instead to paraphrase and summarize material**.**

Be particularly careful to avoid what is called “patchwork plagiarism”, which is the building of a new sentence or paragraph from phrases taken from one or more sources.

Critical Thinking

Critical thinking is central to this course, and probably most of your upper division classes. Critical thinking is a process of intellectually engaging your subject matter. Critical thinking involves more than just questioning the information you receive, it involves relating it to your knowledge and experience. Thus, a critical review is not one in which you necessarily find fault with a paper. In any case, because papers are peer-reviewed they generally do not contain flagrant errors.

The reason why I ask you to do a critical review, rather than a summary, is that I would like you to engage your subject matter. Ask yourself questions like "what is the general relevance of this information," "how could this information be used?", and “are there practical limitations to the remote sensing approach implicitly advocated in this paper?”

Grading Rubric

10 Points Maximum

Grade	Citation	Description of article	Personal evaluation section of report	Grammar, Spelling & Style
10	Follows correct format. Has all information required. Punctuation correct.	Comprehensive summary, excellent paraphrasing of ideas, all key points described, shows insight and depth of understanding.	Student has grappled with article, and made connections to other material (in the course or outside).	Correct, with excellent, *technical English style*. No typographical mistakes (i.e. was proof-read carefully). Style shows strong command of appropriate rhetorical strategies
9	Follows correct format.	Comprehensive summary, key points described	Comments are correct and indicate thought.	Correct grammar and spelling, only occasional mistakes. Well organized, shows evidence of clear thought and good planning
8	Does not follow correct format, has most of the information required.	Relatively comprehensive summary; some sections skipped or not discussed.	Comments are correct, and show a basic understanding	Mostly correct grammar and spelling, but minor mistakes and or colloquial language, above-average work
7	Incomplete	Brief summary; limited understanding, major sections skipped	Perfunctory or shallow comments	Satisfactory work, but , does not demonstrate strengths that indicate an above-average command of technical English, for example, routine structure, inconsistent technical language, or a number of mistakes.
6	Missing	Summary is perfunctory, no understanding shown	Weak	Major problems, for example, communication is hampered by poor language or limited structure.
5 and less	Missing	Weak or missing	Missing	Language is not understandable, incoherent structure, or other issues.

Citation Format

Adapted From: Remote Sensing of Environment

References

References should be cited in the text by the name(s) of the author(s), followed by the year of publication in parentheses, e.g., Baret and Guyot (1991). Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either "Unpublished results" or "Personal communication". Citation of a reference as "in press" implies that the item has been accepted for publication and a copy of the title page of the relevant article must be submitted.

Reference management software

This journal has standard templates available in key reference management packages EndNote (http://www.endnote.com) and Reference Manager (http://www.refman.com). Using plug-ins to word processing packages, authors only need to select the appropriate journal template when preparing their article and the list of references and citations to these will be formatted according to the journal style which is described below.

Reference style

Text: Citations in the text should follow the referencing style used by the **American Psychological Association**. Details concerning this referencing style can also be found at http://linguistics.byu.edu/faculty/henrichsenl/apa/apa01.html.
Reference List: references should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters "a", "b", "c", etc., placed after the year of publication.

Examples

Journal:

Baret, F., & Guyot, G. (1991). Potentials and limits of vegetation indices for LAI and APAR assessment. *Remote Sensing of Environment*, 35, 161-173

Book

Schott, J.R. (1997). *Remote Sensing: The Image Chain Approach*. (pp. 52-62). New York: Oxford University Press

Edited Book

Kaufman, Y.J. (1989). The atmospheric effect on remote sensing and its corrections. In G. Asrar (Ed.), *Theory and Applications of Optical Remote Sensing* (pp. 336-428). New York: Wiley

Reports, Theses, and Other Work

Style as a journal article with as much source information as possible.

Web References
As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references [should be] included in the reference list.

Source:http://www.elsevier.com/wps/find/journaldescription.cws_home/505733/authorinstructions (last accessed 8/19/2010)

Example Review

Jenny Jones

Remote Sensing 455

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Clawges, R., Vierling, K., Vierling, L., and Rowell, E., (2008). The use of airborne lidar to assess avian species diversity, density, and occurrence in a pine/aspen forest. *Remote Sensing of Environment,* 112(5), 2064-2073.

Clawges et al. (2008) test the ability of discrete return airborne light detection and ranging (lidar) to quantify the three-dimensional structure of pine/aspen forests in South Dakota and correlate this to field- survey based bird species diversity and abundance. They further combine lidar with multispectral IKONOS satellite data to see if the resulting habitat delineations relate to the density and occurrence of dark-eyed juncos and warbling vireos, two common bird species in the area that depend on understory vegetation. Because habitat structure is thought to be a major factor determining habitat suitability for birds and many other organisms but can be difficult or costly to obtain, lidar shows great promise in deriving this key habitat feature remotely and at large spatial scales. The addition of spectral data strengthened the lidar application by providing additional information on habitat composition (i.e. aspen vs. pine as the dominant tree species).

Ground (bare earth) laser returns were first separated from above ground (vegetation) returns in order to create a triangular irregular network (TIN), which was converted to a high resolution 0.25 meter raster representing the ground surface. Another TIN of the same resolution was created for the above ground returns. Subtracting the ground TIN from the vegetation TIN provided a profile of remotely sensed vegetation heights which were used in selecting field sites that were open or with two height classes of understory vegetation (low: 0.5-2.0 meter vs. high: 2.0-9.0 meter dominated). IKONOS imagery further stratified the understory vegetation sites as pine-dominated or aspen-dominated. This resulted in five *a-priori* habitat types within which avian and habitat structure data were collected.

Both indices of field-collected vegetation structure, tree stem density and tree vegetation density, were positively and significantly correlated (r^2=0.51 and r^2=0.68; respectively) with the lidar-derived tree vegetation index.

While correlations between lidar-derived foliage height diversity and bird species diversity were positive and generally significant, r^2 values were small indicating relatively little of the variation in bird species diversity was explained. The lidar derived shrub density index was more strongly correlated, positively and significantly, with the relative density of dark-eyed juncos and warbling vireos, however. Further analysis showed that within the pine-dominated sites dark-eyed juncos were significantly more abundant when the low understory was dominant, while warbling vireos were significantly more abundant in both pine and aspen sites dominated by the low understory.

<u>Personal Evaluation</u>

Lidar seems to remotely sense habitat structure effectively as indicated by the strong correlation to measures of this structure obtained directly. As the authors point out, however, many factors beyond habitat structure may determine bird distributions as evidenced by the weak but significant correlations between structure and a broad measure such as species diversity. The stronger results from the focal species approach they also employ are of greater interest to me. I know from much field experience the effort involved in assessing vegetation structure and composition, and combining the classification of habitat through imagery with the vertical structure data provided by lidar is quite exciting even if it is beyond my capacity at present.

(Note: This example is 388 words for the main part, 114 words for the personal evaluation.)