

# Research Paper: Review of Literature

## Due 4/28

### Directions

You will perform the entire review of literature process starting with the annotated bibliography (<http://writing.wisc.edu/Handbook/AnnotatedBibliography.html>) and producing a writeup following the directions at <http://writing.wisc.edu/Handbook/ReviewofLiterature.html>. You must use Endnote for the annotated bibliography (see CSE downloads).

You will choose a topic, find references (both from the academic and trade literature as appropriate), review that literature, then express that review in a write up that shows at least moderate insight and good editing, suitable for publication in a conference such as AAAI or a conference about the application (e.g., IEEE Robotics and Automation).

### Step 1: Picking an Initial Topic

Your topic must clearly relate to **artificial intelligence for robotics**. It should be of personal interest and if it relates to your thesis, even better! If you have questions or doubts about a good topic, ask ;-)

Doing a literature review of “machine learning in robotics” is intractable because it is too broad. That’s what textbooks are for. Doing a literature review of machine learning for controlling unmanned marine vehicles is much more tractable. It is generally very hard to do a literature review of the academic literature on what is being used in industry; industry often doesn’t want to publish what it is doing in sufficient detail for fear of competition and their implementations do not appear in academic journals.

You may want to start with reading chapters in the Springer Handbook of Robotics to find interesting topics and ground yourself.

Be aware that you will probably refine or adjust your topic while you conduct your annotated bibliography. That’s a primary reason why we do the annotated bibliography and then downselect! For example, searching the literature for artificial intelligence methods to detect video replay attacks on unmanned aerial vehicles may turn up two papers. It is good to know that no one is researching that topic (or at least not publishing about it), but that’s not sufficient for a paper. So instead a review of all the artificial intelligence methods for detecting cyberattacks in UAVs may become the topic.

### Step 2 Annotated Bibliography

Create an annotated bibliography and enter into Endnote. Bring a copy to  
To be more specific:

1. 1 page separate title with your name and the :
  - a. motivating question
  - b. evaluative style template you used (i.e., the types of information you are looking for in the paper)
2. A printout of the Endnote library. Inside Endnote entry
  - a. Must attached abstract if a scientific journal or paper
  - b. PDF must link to a pdf of the article (books are exempted). YOU WILL INCLUDE THE PDFs of all papers as separate files.
  - c. In the “Research Notes” slot in the Endnote reference entry, you will put your annotation. **Use the evaluative style** with no description, unless there is no abstract in which case begin with a description (be sure and check out the evaluative examples in the UW Madison Writer’s Handbook on annotated bibliographies).
    - i. Using the evaluative style means coming up with a template or FRAME to use AI-speak ;-) that you will use for EVERY paper to “connect the dots” in your annotated bibliography- how the paper relates to your topic and how you would use (or would discard) their methods or findings
    - ii. This means you will start out with a set of slots for your Frame. But you will probably revise and expand that Frame and have to redo your annotations at least once.
      1. Example of template Frame:
        - a. Topic: viewpoint selection, viewpoint optimization, other
        - b. Relevance to my topic: same motivation, etc.
        - c. Potential contribution: shows viewpoint optimization is solved for manufacturing robots with complete a priori knowledge; good experimental methodology so consider duplicating
        - d. Experiments: on a robot, on a simulated robot, theory only, other

*How do I find papers?* Not Google Scholar. Repeat this out loud: Not Google Scholar. Google Scholar is not sufficient for the in-depth search required by this project. Google Scholar is great for determining keywords and finding missing pdfs, but that is about it.

Instead for academic papers, IEEE Xplore, Science Direct, ACM Digital Libraries online databases are mandatory. Note, you search ALL three because though there is some overlap due to co-hosted conferences, they generally archive very different communities. There are other CS and Engineering electronic databases- see the Evans library web page on CS databases. A major feature of these databases is that they often show who have cited a paper, which can be helpful in tracking down

those papers- if you are interested in the paper and someone else was interested in the paper and used it for their paper, that someone may be researching the same topic. You may need to visit the reference desk at the library and make an appointment to get more advice and help.

*About how many papers?* This, as so many other things in life, depends. In order to be tractable for a course, there should be at least 10 papers (unless special circumstances<sup>1</sup>) but no more than 30.

*But how can I read so many papers?* You don't. See *How to Read A Paper* by Keshav. You read each paper for a first pass to see if it is really relevant versus superficially relevant. Don't throw those superficially irrelevant because you will include them in your review and explain why they are irrelevant. If a paper is relevant, then you will read it for a second pass, or if it's really, really relevant and important for a third pass. But you generally only need to do a first and second pass to refine your topic- which is an objective of the annotated bibliography. Once you have cemented your topic and turned in your Annotated Bibliography, then you can go to the third pass of reading.

*About the range of Dates for the Search...* Since many advances in software advances outstripped hardware advances, there are many efforts in the 1984-2000 time period that may be relevant. As they are more than 10 years old, they are not guaranteed to show up on online searchers or in electronic databases.<sup>2</sup> Therefore it is imperative to go to the library and examine conference proceedings, journals, and books from this era. So search from 1984<sup>3</sup> through current.

### **Step 3 Literature Review (50 points) due 4/28**

The literature review consists of a single compressed file:

- a .docx of the literature review using the IEEE Robotics and Automation conference style
- a printout of the annotated bibliography showing the full bibliographic citation and annotation for each
- Endnote library (complete with subfolders)

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<sup>1</sup> Occasionally you will hit upon a new topic, one that perhaps only 3 or 4 others have considered. This is great in terms of novelty, not so good in terms of learning to do literature reviews or AI robotics. If you were doing this for a PhD, your review of literature would have to convince the reader that there really were no other references and then go deeply into the few instances.

<sup>2</sup> But there would be no PDF? You will have to manually scan the article. But generally, Google Scholar will be of use for finding a pdf.

<sup>3</sup> Read into 1984 as a date what you will.

- PDFs of all papers cited

The written review of literature should follow the University of Wisconsin template plus the Endnote file of the annotated bibliography (probably updated)

### **Grading:**

#### **Annotated bibliography (40% of total grade):**

- + 30 has a tractable number of references (between 10 and 30)
- + 30 references are relevant (some references may not be informative but would be included in a literature review with a short dismissal, e.g., “[citations] discuss topic T1, which is similar to but differs from topic T in two ways...”)
- + 30 annotations follow the evaluative style, are helpful, and likely to allow the writer to quickly determine what papers to go back and read for what aspects.
- + 10 follows directions

#### **Review of literature (60% of total grade):**

- + 40 Follows the University of Wisconsin review of literature template (has the required information in the introduction, body, and conclusion)
- + 20 Is clearly organized, has strong topic sentences, and is readable
- + 20 Does not have a significant number of grammatical errors or awkward sentences
- + 10 Offers a useful and justified classification of the systems, connecting architectural theory with practice
- + 10 Shows deep or novel insights into architectural theory and practice

### **Required Formatting:**

**Failure to follow formatting requirements and not providing the video and the final files is an automatic F.**

Note: below an 80 is considered failing for a graduate course.

IEEE Robotics and Automation conference style in Word .docx