

Research Presentation

Overview and purpose

For this assignment, you will carefully study a recent research paper in robotics. The objectives are to expand the depth of your knowledge in at least one portion of the field and to expand your experience with understanding and presenting research results.

The Task

The assignment has several steps:

1. **Select** an article from [Robotics and Automation Magazine \(RAM\)](#). This is a quarterly publication from the IEEE Robotics and Automation Society that features articles about current robotics research written for technical audiences, but usually in a form that is a little more accessible to non-experts than many other publication venues.

On the main RAM website, use the link [Robotics & Automation Magazine on IEEE Xplore](#) to see the articles published in RAM. when you are connected via the Texas A&M network, you should have free access to RAM articles via the A&M subscription.

You must select an article from RAM that meets all of the following criteria:

- The article must have been published in 2023 or later. (This is to ensure that the article you study is reasonably representative of the current state of the art.)
- The article must be at least 8 pages long. (This is to ensure that the article you study is a fully-formed technical contribution.)
- The article must include at least one photograph of a robot. This robot must have been used as part of the research described in the article.
- The article must not have been selected by any other student. (This is to ensure breadth of subject matter covered across the class.)
- The article must be approved by the professor. This can be requested by sending email to the professor with the title of the article. (The purpose of this requirement is to maximize the

chance of success in the later steps of the process; the professor expects to approve most choices without any additional discussion.)

2. **Study** the article and the relevant related material carefully, to the point that you thoroughly understand the contributions described there.
 - What problem is being addressed by the research described in the article? What do the researchers want their robot(s) to achieve? Why is this important?
 - How was this issue addressed, before the advances described in the article were made?
 - How does the approach work? Why does it work that way? What is the overall intuition? What do the key technical terms used in the article mean? How do the main algorithms work?

Completing this step properly will require several careful read-throughs of the paper, supplemented by additional research on your part including checking related papers, textbooks, and other resources to fill in details that cannot be understood in full directly from the paper. Therefore, you should **document** the additional sources you consult and the information gathered from each of them, to include as a separate document within the final submission. To complete this step, you should aim for strong mastery of the material in the article.

3. **Prepare** a presentation of what you've learned, in the form of a well-polished video 6-7 minutes in length.
 - The video should include both visual (i.e. slides) and audio (i.e. narration) elements. The visual part of the presentation should strongly emphasize photos, diagrams, illustrations, and other similar elements. A good rule of thumb is that nearly every slide should have some sort of non-textual content.
 - The video should be prepared in a 'widescreen' format, i.e. a 16:9 aspect ratio, or similar.
 - The target audience should be a typical student in CSCE452: A reasonably technically-competent person who has seen a broad overview of robotics and written some ROS code, but who has not studied the specifics of the area covered in your paper.
 - The video should begin with you introducing yourself. Then mention the title, authors, and details about where and when the paper was published.
 - The main objective of the video should be to clearly answer the questions posed in Step 2 above. Achieving this objective will require you to distinguish between the main research contributions and the less-important details, and to focus the video on the main contributions.
 - The video should conclude with a short summary of the main ideas.

- Take careful note of the time constraints mentioned above. If your video is more than 7 minutes, you should think carefully about which details in the paper are most important, and adjust the presentation accordingly. This process of distilling the full detail in your paper down to a clear and concise presentation of the core ideas is an important part of what this assignment is about. (Note: Students whose first attempts are too long occasionally try to meet the time limitation by speaking faster. This produces poor results, and is more obvious than these students tend to think.)
- The visual part of the video should emphasize photos, diagrams, and videos that amplify the message of what the audio part of the video is saying. Some text is likely to be necessary, but extensive text, especially when it is read to the audience, is discouraged.
- The video should be prepared without any extraneous visible elements. For example the GUI for your presentation software should not be visible, nor should any visible elements from your recording software.
- Note the expectation above that this should be "a well-polished video". This includes the ensuring that audio is clean, free of background noise, and at a consistent reasonable volume level throughout. It also includes an expectation that the content is clear, precise, and free of both technical errors and typographical errors.

The completed videos will be evaluated based on their adherence to the basic guidelines, along with their clarity, technical correctness, creativity, and polish.

4. **Ensure** that your video file meets the following technical requirements:

- File size for the video must be 100MB or less.
- The video must be encoded in a format that plays in a typical modern web browser. If I cannot play the video, I cannot evaluate its success in meeting the project objectives. (You do not need to upload your video to any video-sharing service like YouTube or Vimeo — just submit the video directly to Canvas.)
- The files should be named according to your name, like this:

lastname_firstname.mp4

lastname_firstname.pdf

5. **Submit**, by the deadline listed above:

- the completed video, and
- the list of additional resources utilized (as mentioned in Step 2) as a PDF.

After the submission deadline, these presentation videos will be shared with the class.

