

# DS265 (2023) Project selection

Your first task is to pick a project topic. Most students do one of the three kinds of projects:

- Application project: This is by far the most common: Pick an application that interests you, and explore how best to apply learning algorithms to solve it.
- Algorithmic project: Pick a problem or family of problems, and develop a new learning algorithm, or a novel variant of an existing algorithm, to solve it.
- Theoretical project: Prove some interesting/non-trivial properties of a new or an existing learning algorithm. (This is often quite difficult, and so very few, if any, projects will be purely theoretical.)

Some projects will also combine elements of applications, algorithms, and theory.

Many fantastic class projects come from students picking either an application area that they're interested in or picking some subfield of DLCV that they want to explore more. So, pick something that you can get excited and passionate about! Be brave rather than timid, and do feel free to propose ambitious things that you're excited about. (Just be sure to ask us for help if you're uncertain how to best get started.) Alternatively, if you're already working on a research or industry project that machine learning might apply to, then you may already have a great project idea.

A very good DS265 project will be a publishable or nearly-publishable piece of work. Each year, some number of students continue working on their projects after completing DS265, submitting their work to conferences or journals. Thus, for inspiration, you might also look at some recent DLCV research papers. Three of the main DLCV conferences are CVPR, ICCV and ECCV. You can find papers from recent CVPR & ICCV conferences online:

<https://openaccess.thecvf.com/menu>. All NeurIPS papers are online, at <http://books.nips.cc/>.

You will be able to find short video summaries of papers published in 2022 (eg.:

[https://www.youtube.com/channel/UC0n76gicaarsN\\_Y9YShWwhw/videos](https://www.youtube.com/channel/UC0n76gicaarsN_Y9YShWwhw/videos))

Once you have identified a topic of interest, it can be useful to look up existing research on relevant topics by searching related keywords on an academic search engine such as:

<http://scholar.google.com>. Another important aspect of designing your project is to identify one or several datasets suitable for your topic of interest. If that data needs considerable pre-processing to suit your task, or if you intend to collect the needed data yourself, keep in mind that this is only one part of the expected project work, but can often take considerable time. We still expect a solid methodology and discussion of results, so pace your project accordingly. It is best to use existing datasets.

Lastly, it would be useful to choose projects based on the computational resources you have/ the GPUs have access to. For example, a task like semantic segmentation or superresolution might be significantly more expensive than a project involving algorithms related to classification. Some free GPU resources are [GoogleColab](#) and [Paperspace](#). Google Colab runs for a max of 12 hours and needs an active browser and an active internet

connection throughout the run. While paperspace does not require an active browser, it allows runs upto only 6 hours. Another caveat with free resources is that they are not always available. So it is best if you have access to GPUs in your lab.

Here are some useful links for helping you with the selection of project topics:

<http://cs231n.stanford.edu/project.html>

<http://cs231n.stanford.edu/reports.html>

<https://val.cds.iisc.ac.in/publications.html#conferences>

Please feel free to reach out to us for queries/ help with selection of project topic.