

Machine Learning Project Topic Guideline

Artificial Intelligence & Robotics, B.A.T.

ITAI 1371

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Use this for **BOTH Midterm Project and Final Project**

You will complete this process **two times**:

1. Once to choose your **Midterm project**
2. Once again (later in the semester) to choose your **Final project**

The two topics and projects should be sufficiently distinct to be graded as separate projects and to strengthen your portfolio. This will be double-checked with you after submitting your abstract.

Step 1 — Start With You

Pick 1 area you care about:

- Health/fitness
- Business/marketing
- Finance
- Sports
- Music/art/media
- Education
- Gaming
- Engineering/science
- Environment / Social media
- Other topic you think might be interesting, and you can find relevant work being done using ML

Step 2 — Turn Your Interest Into ML Project Ideas

Machine learning projects usually do one of these things:

- Predict a number (example: house price)
- Classify something (example: Healthy/Unhealthy test results)
- Detect something (example: Pattern detection)
- Recommend something (example: music/movie recommendations)
- Group similar things (example: clustering customers)

Now try to write 3 possible project ideas using this format:

1. “Can ML predict ____ using ____?”
2. “Can ML classify ____ into ____ categories?”
3. “Can I detect ____ from ____ data?”

Step 3 — Learn What the Best Work is Doing (State-of-the-Art)

Now search what people/companies already do in your topic.

Find 2 sources:

- one research paper (Google Scholar is good)
- one trusted article or blog (company blog, university blog, etc.)

For each source, write one sentence answers:

1. What are they trying to solve?
2. What data did they use? Can you access that data
3. What ML method did they use?
4. What's one important result?

Your goal here is not to understand everything.
Your goal is to understand the “big picture”.

Step 4 — Look at 3 Big Companies

Now explore the real world.

Choose 3 big companies related to your topic. Start with the dream companies you want to work at or the companies you admire in general.

Example:

- Healthcare: Google Health, Medtronic, Microsoft
- Technology/AI: Amazon, Meta, OpenAI, NVIDIA
- Transportation: Tesla, Uber, Waymo

For each company, answer in one sentence:

1. Choose 3 big companies related to your topic.
2. What product or technology are they building?
3. How does ML help them?
4. What is one interesting detail you learned?

Step 5 — Shrink Your Topic to Match This Course

Big ideas are great, but your project must be doable.

Your course project should:

- use a public dataset (Kaggle, UCI, etc.).
- use course-level ML models and available libraries in Python.
- produce measurable results and compare with your selected paper in step 3.

Questions you want to answer in this step:

1. What dataset will you use (or what dataset type)?
2. What is your input (features)?
3. What is your output (target)?
4. What is your algorithm (Classification, Regression, etc.)?
5. Which models will you try?

Step 6 — Write Your Abstract (One Paragraph, ~half page)

It must include:

1. What problem you want to solve
2. Why it matters
3. What others are doing in this area (state of the art)
4. What companies are doing in this area
5. What YOU will build for this course

Step 7 — Talk about your idea

What you will submit:

Submit a document with these sections:

1. Your interest area (1 sentence: This is phrased like a Title or Topic)
2. Step-by-step approach (1-6) described in this document with answered questions. In the document, make each step Heading 1 and each question under the respective heading.
3. One paragraph abstract

Prepare to talk about your idea for about 5 minutes and answer questions.

Note: After your first submission, you will receive feedback from the instructor to help you improve and refine your project idea. This feedback will not affect your original submission grade—it is meant to help you choose the best project topic for the course. The Submission grade is measured on the completeness of the document and on following the steps.