GUIDE · BASE PAPER

How to implement a base *paper*

To implement a base paper, **get its code and dataset, set up the same environment, reproduce one main result from its results table, and record how close you got and why**. Only then change the method. If no code is published, rebuild the method from the paper, starting with its simplest baseline.

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Below: the steps in order, what to do when the code or data is missing, why your numbers may not match, and how the reproduced result becomes the comparison table in your report.

KEY POINTS

- **Reproduce before you improve.** Your contribution is measured against the result you reproduced, not only the paper's.
- **Pick one target number** from the paper's main table and aim for that first.
- **Match the setup exactly:** dataset version, split, preprocessing, metric and key settings.
- **Keep a log** of every setting you used or had to guess. It becomes your methodology chapter.
- **A small, explained gap is fine.** An unexplained one means something still differs.

How do you implement a base paper, step by step?

1 Read the paper for the setup, not the story.

Note the dataset and its version, the train and test split, the preprocessing, the model or circuit, the settings (learning rate, epochs, batch size, clock frequ

ency, simul ation para meter s) and the metri c. Chec k the suppl emen tary mater ial and appe ndix too.

2 Choose one target result.

Pick a single row of the main result s table, usuall y the paper ’s best meth odon

its main dataset, and write the number down.

3 Find the code.

Look for a repository link in the paper, the authors' pages, GitHub and Hugging Face. Official code is best; well-used

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4

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h. For hard ware paper s, list the boar d, senso rs and tools and price them.

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Set up the environment.

Use the langu age and libra y versio ns the code expe cts, in a sepa rate virtual envir onme nt. Fix the rando

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Reproduce the target number.

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8

Record the gap and its reason.

Write the paper ’s numb er, yours, and what differ s. This table

goes straight into your report and review slides.

What if the code or the data is not available?

No code: rebuild the method from the paper. Implement the simplest baseline the paper compares against, reproduce that number first, then add the paper's components one at a time, checking the result after each. Where the paper leaves a setting out, choose a standard value and note it. **No data:** look for the same dataset on its official page or a mirror the authors name; if it is private, use the closest public dataset and say so. If both code and data are missing and the method is complex, the paper is a poor base paper. See the red flags in our base paper guide before you commit.

Stuck reproducing it?

Send the paper and what you got so far. The consultation is free.

Free consultation → WhatsApp

Why don't my results match the base paper?

Common reasons a reproduced result differs from the paper

REASON	HOW TO CHECK
A different split or dataset version	Compare the number of samples per class with the paper's table
Different preprocessing	Image size, normalisation, filtering, tokenisation or sampling rate
The metric is computed differently	Macro or weighted averages, per-class or overall, threshold used
Fewer epochs or a smaller model	Training curves still rising at the end
Random seed	Run two or three seeds and report the mean
Library versions	Match the versions in the repository's requirements file
Test data leaking into training	A result far better than the paper's is a warning, not a win

How do you turn the implementation into your contribution?

Once the baseline is reproduced, make **one change** and measure it on the same setup: a new or Indian dataset, a test on harder conditions, a lighter model for a phone or microcontroller, a different backbone, or an explanation of the output. Show the result as three numbers side by side: the paper's, your reproduced one and your improved one. For an M.Tech that table is the core of the thesis; for a B.Tech project, a reproduced result inside a working application is usually enough. Present the plan at your first review with our base paper presentation guide and its free PowerPoint template.

Need a paper that is easier to reproduce? Every paper on our IEEE base papers list is open access and names its datasets, with a B.Tech scope and an M.Tech extension for each.

What should you record while implementing?

- The paper's target number and the table it comes from.
- Dataset name, version, source link and the split you used.
- Every setting, and which ones you had to guess.
- Library versions and hardware (CPU, GPU or board).
- Each run's result with its seed and date.
- What you changed for your contribution, and its result.

This log becomes the methodology and results chapters, and it is what examiners ask about in the viva; see our project viva questions.

Frequently asked questions

What if the base paper has no code?

Rebuild it from the method section. Start with the simplest model the paper compares against, get that working on the same data, then add the paper's own method one part at a time. Write down every setting you had to guess. If too much is missing, choose another paper; our guide to choosing a base paper lists what to check first.

How close must my result be to the paper's?

Close enough that the difference has a clear reason. A small gap is common because of a different split, random seed, hardware or fewer training epochs. Report both numbers honestly. A large unexplained gap usually means the setup does not match yet.

Can I implement a base paper without a GPU?

Often, yes. Classical machine learning, signal processing, VLSI and most IoT papers run on a laptop. For deep learning, free cloud notebooks such as Google Colab and Kaggle offer limited GPU time; train a smaller model or fewer epochs and say so in your report.

How do I write the implementation in my report?

In the results chapter, show a table with the paper's number, your reproduced number and your improved number on the same metric, then explain each difference. The M.Tech thesis format and the project report format show where this goes.

Can The Ultimate Project World help implement a base paper?

Yes. Send the paper, your level and your review date in the free consultation. We help reproduce the result, choose and build the extension, and prepare the report and viva. See our IEEE base paper projects.

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