

| **Proejct Title** | Knee MRI Classification |
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| **Technologies** | Deep Learning Technology (CNN) |
| **Domain** | Healthcare |
| **Project Dificulties level** | Intermediate |

**Problem Statement :**

Magnetic resonance imaging (MRI) of the knee is the preferred method for diagnosing knee injuries. However, interpretation of knee MRI is time-intensive and subject to diagnostic error and variability. An automated system for interpreting knee MRI could prioritize high-risk patients and assist clinicians in making diagnoses. Deep learning methods, in being able to automatically learn layers of features, are well suited for modelling the complex relationships between medical images and their interpretations.

**Approach**: Due to the varying characteristics of the license plate from country to countries, like numbering system, colours, the language of characters, style (font) and sizes of a license plate, further research is still needed in this area.

**Results:** In most countries, they use Arabic and English letters, plus their national logo. Thus, it makes the localization of plate number, the differentiation between Arabic and English letters and logo's object and finally, the recognition of those characters become more challenging research task. The use of the artificial neural network has proved itself beneficial for plate recognition, but it has not been applied for plate detection.

You have to build a solution that should recognize many places with uttermost clarity in any circumstances. With a varying distance and colour combinatoin, it should work for any Indian continent.

**Dataset:**

You have to collect your dataset for this project for the Indian continent, and based on that, you have to design your solution and create a repo for the dataset.

**Project Evaluation metrics :**

**Code:**

* You are supposed to write a code in a modular fashion
* Safe: It can be used without causing harm.
* Testable: It can be tested at the code level.
* Maintainable: It can be maintained, even as your codebase grows.
* Portable: It works the same in every environment(operating system )
* You have to maintain your code on Github.
* You have to keep your GitHub repo public so that anyone can check your code.
* Proper readme file you have to maintain for any project development.
* You should include basic workflow and execution of the entire project in the readme file on GitHub
* Follow the coding standards: <https://www.python.org/dev/peps/pep-0008/>

**Database:**

* You are supposed to use a given dataset for this project which is a Cassandra database.
* <https://astra.dev/ineuron>

**Cloud:**

* you can use any cloud platform for this entire solution hosting like AWS, Azure or GCP

**API Details or user interface:**

* you have to expose your complete solution as an API or try to create a user interface for your model testing. Anything will be fine for us.

**Logging:**

* Logging is a must for every action performed by your code use the python logging library for this.

**Ops Pipeline:**

* If possible, you can try to use AI ops pipelining for project delivery Ex. DVC, Mlflow , segmaker , Azure machine learning studio, Jenkins, Circle CI, Azure DevOps , Tfx, Travis CI

**Deployment:**

* You can host your model in the cloud platform, edge devices, or maybe local, but with a proper justification of your system design.

**Solutions Design:**

* you have to submit complete solution design strategies in HLD and LLD document

**System Architecture:**

* You have to submit a system architecture design in your wireframe document and architecture document.

**Latency for model response:**

* you have to measure the response time of your model for a particular input of a dataset.

**Optimization of solutions:**

* Try to optimize your solution on code level, architecture level and mention all of these things in your final submission.
* Mention your test cases for your project.

**Submission requirements:**

**High-level Document:**

You have to create a high-level document design for your project. You can reference the HLD form below the link.

Sample link:

[HLD Document Link](https://drive.google.com/drive/folders/1j2Y0OhZ_ukZ5K_WicH1TFST0g-IwTQU7)

**Low-level document:**

You have to create a Low-level document design for your project; you can refer to the LLD from the below link.

Sample link

[LLD Document Link](https://drive.google.com/drive/folders/19FkUepjYQZPOlIyoBr4Q6WhKAllFpfWG)

**Architecture:** You have to create an Architecture document design for your project; you can refer to the Architecture from the below link.

Sample link

[Architecture sample link](https://drive.google.com/drive/folders/1tYtI1KtUbIHzoIt24If0oELAfWm9I9QV)

**Wireframe:** You have to create a Wireframe document design for your project; refer to the Wireframe from the below link.

**Demo link**

[Wireframe Document Link](https://drive.google.com/drive/folders/1e7ovjnUYaMp-2ouqbJUAreHwuughB768)

**Project code:**

You have to submit your code Github repo in your dashboard when the final submission of your project .

**Demo link**

[Project code Google drive link](https://drive.google.com/drive/folders/1jJPp4ALvf3FDtRRsKTqCKs2m3jDT8nGe)

[Project code GitHub link](https://github.com/swapnilpjoshi/KneeMRI)

**Detail project report:**

You have to create a detailed project report and submit that document as per the given sample.

**Demo link**

[DPR sample link](https://drive.google.com/drive/folders/18jHvWdtLHAVuttJPUL9R0srwlNH44Spq)

**Project demo video:**

You have to record a project demo video for at least 5 Minutes and submit that link as per the given demo.

**Demo link**

[Project sample link :](https://www.youtube.com/watch?v=hBLdlx_U4L8&list=PLmQAMKHKeLZ_dmcPBxdiZ-1qN2iMexErg&index=5)

**The project LinkedIn a post:**

You have to post your project detail on LinkedIn and submit that post link in your dashboard in your respective field.

**Demo link**

[Linkedin post sample link :](https://www.linkedin.com/posts/animeshnayak_yolo-datascience-kaggle-ugcPost-6815656927792525312-Xp9z)