

1.1 Problem Statement

What problem is your project trying to solve? Use non-technical jargon as much as possible.

We are trying to solve the problem of detecting skin cancer, our project aims to have an AI model that can do that.

1.2 Requirements & Constraints

List all requirements for your project . This includes functional requirements (specification), resource requirements, qualitative aesthetics requirements, economic/market requirements, environmental requirements, UI requirements, performance requirements, legal requirements, maintainability requirements, testing requirements and any others relevant to your project. When a requirement is also a quantitative constraint, either separate it into a list of constraints, or annotate at the end of requirement as “(constraint)”. Other requirements can be a single list or can be broken out into multiple lists based on the category.

Functional requirements:

- Web Interface to access model
- Ability to access model from around the world
- Able to input images to receive results

Resource requirements:

- Google or AWS cloud environment
- Access to the data required to create a cancer model
- High power GPU computer

Qualitative aesthetics requirements:

- The model should follow a consistent design pattern in terms of UI

Economic/market requirements:

- The project should take zero funding to make (constraint)

UI requirements:

- Interface that is easy to use and navigate

Performance requirements:

- Model is able to output results within seconds or little to no delay

Legal requirements:

- Ensuring that the photos provided from medical institutes are acceptable to use.

Maintainability requirements:

- The model should be able to gracefully degrade as it gets more advanced and should continually upgrade itself as it learns more through its neural network.

Testing requirements:

- **Make sure model runs as intended and is able to give accurate results**

1.3 Engineering Standards

What Engineering standards are likely to apply to your project? Some standards might be built into your requirements (Use 802.11 ac wifi standard) and many others might fall out of design. For each standard listed, also provide a brief justification.

Standards:

- IEEE 730
 - This is a software project and therefore should adhere to typical software quality assurance processes, similar to those laid out in IEEE 730.
- IEEE 828
 - We will need to follow the minimum requirements for Configuration management within our project.
- IEEE 29148
 - There will be various development stages required in order to create our model, IEEE 29148 talks about the provisions and requirements for these different stages.
- IEEE 1012
 - We'll need to be able to identify whether or not the given problem (detecting skin cancer) was able to be solved by our software as well as the consumer using it has their problem solved.
- IEEE 16326
 - Since this is a group project it'll be important to identify key points in relation to project management, specifically planning, monitoring, quality management, documentation, etc.
- IEEE 24748
 - Since the project will have a user interface for non-expert audience, it will require documentation or a tutorial.
- ISO/IEC 29119
 - Since the software project involves A.I, rigorous testing will be needed to both train and test the A.I. Therefore, great documentation and testing standards are needed.
- Google or AWS Cloud Environment
 - Cloud computing will help run the software project
- Python Language
 - Almost all A.I. libraries are in Python.

1.4 Intended Users and Uses

Who benefits from the results of your project? Who cares that it exists? How will they use it? Enumerating as many “use cases” as possible also helps you make sure that your requirements are complete (each use case may give rise to its own set of requirements).

The results of the project will benefit a lot of different people including patients that have skin cancer, doctors who are trying to diagnose skin cancer, patients who do not know that they have skin cancer. The people that will care that this project exists will be every single patient, doctor, family member, or friend that has been or knows someone that has been affected by skin cancer, especially the people that have found it too late. This project also has a very strong appeal to the Mayo clinic because they already have adopted many projects like this one. Patients and doctors will use this project to help get a head start on the prognosis of the cancer to stay in front of it so that they can get the cancerous part removed before it spreads to any more of the body. The project will be working hand in hand with AI to detect possible signs of skin cancer on the body by training simple AI models to recognize the signs of skin cancer by using real images from multiple different medical institutes.