



Knight Foundation
School of Computing
and Information Sciences

Knight Foundation School of Computing and Information Sciences

Summer 2024 Senior Design Project

Cancer Outcome and Recurrence Prediction Tool

Students: Alexis Diaz, Joshua Andres Fernandez, Sebastian Galloway, Michelle Pacheco, Raul Pena

Mentor: Chris Poellabauer, Ph.D

Instructor/Faculty: Dr. Masoud Sadjadi, Florida International University

PROBLEM

Cancer is a disease that comes in many forms, and its treatments are just as varied. This requires personalized treatment plans to be made for every patient based on their medical history and numerous other factors.

CURRENT SYSTEM

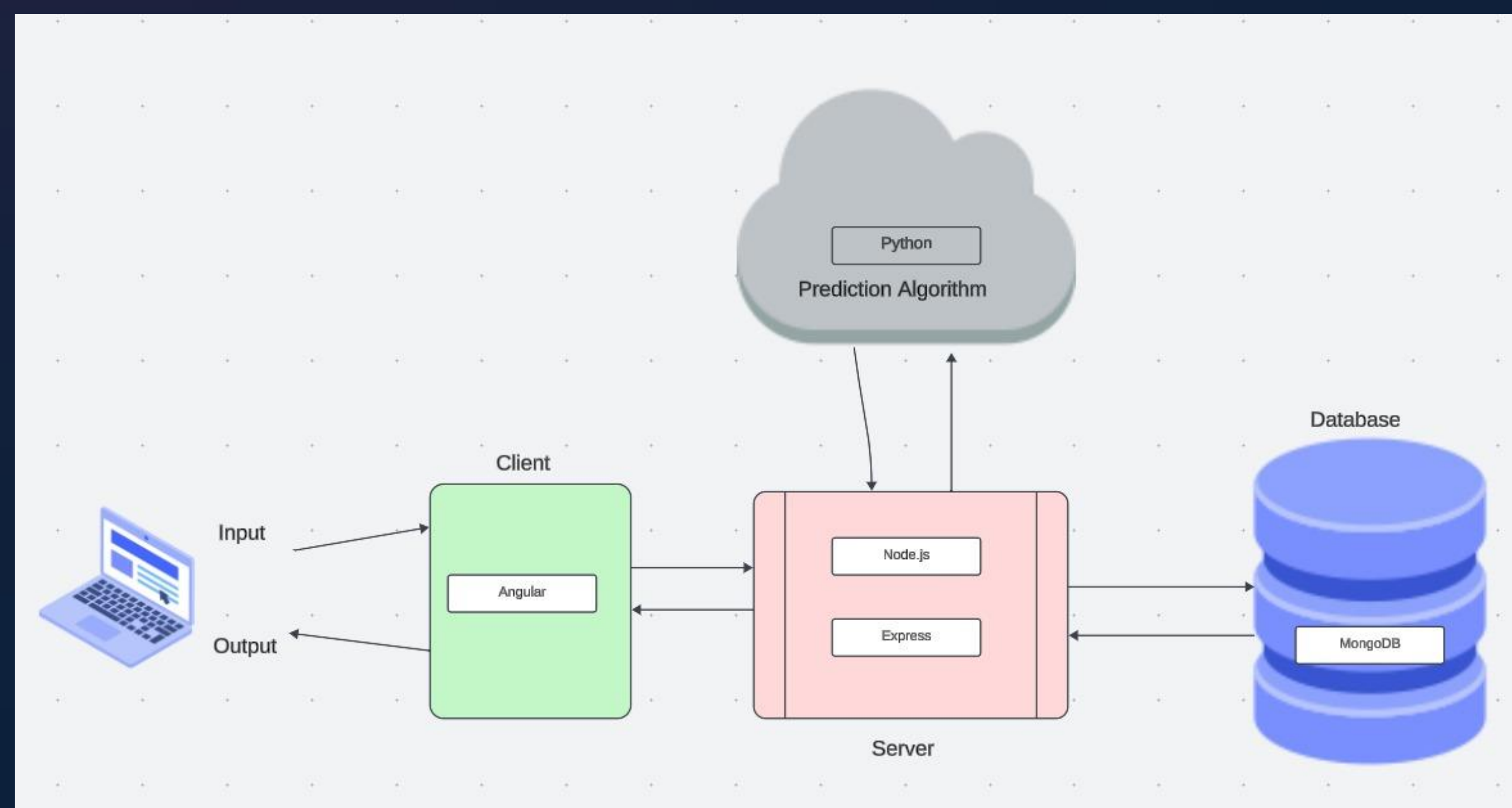
Currently, treatment plans must be personalized by a certified oncologist, in collaboration with other medical specialists. This personalized plan heavily depends on what treatments a given patient's doctors specialize in and may not be the treatment plan with the statistical highest likelihood of success and lowest chance of cancer recurrence.

REQUIREMENTS

Given current medical research and data collection, the product owner requires a tool that utilizes a machine learning algorithm to recommend a personalized treatment plan for a patient given their medical history.

The tool must offer medical professionals with a simple dashboard to manage patients, treatment plan predictions, and modify treatment elements to better reflect their expertise and explore alternate options.

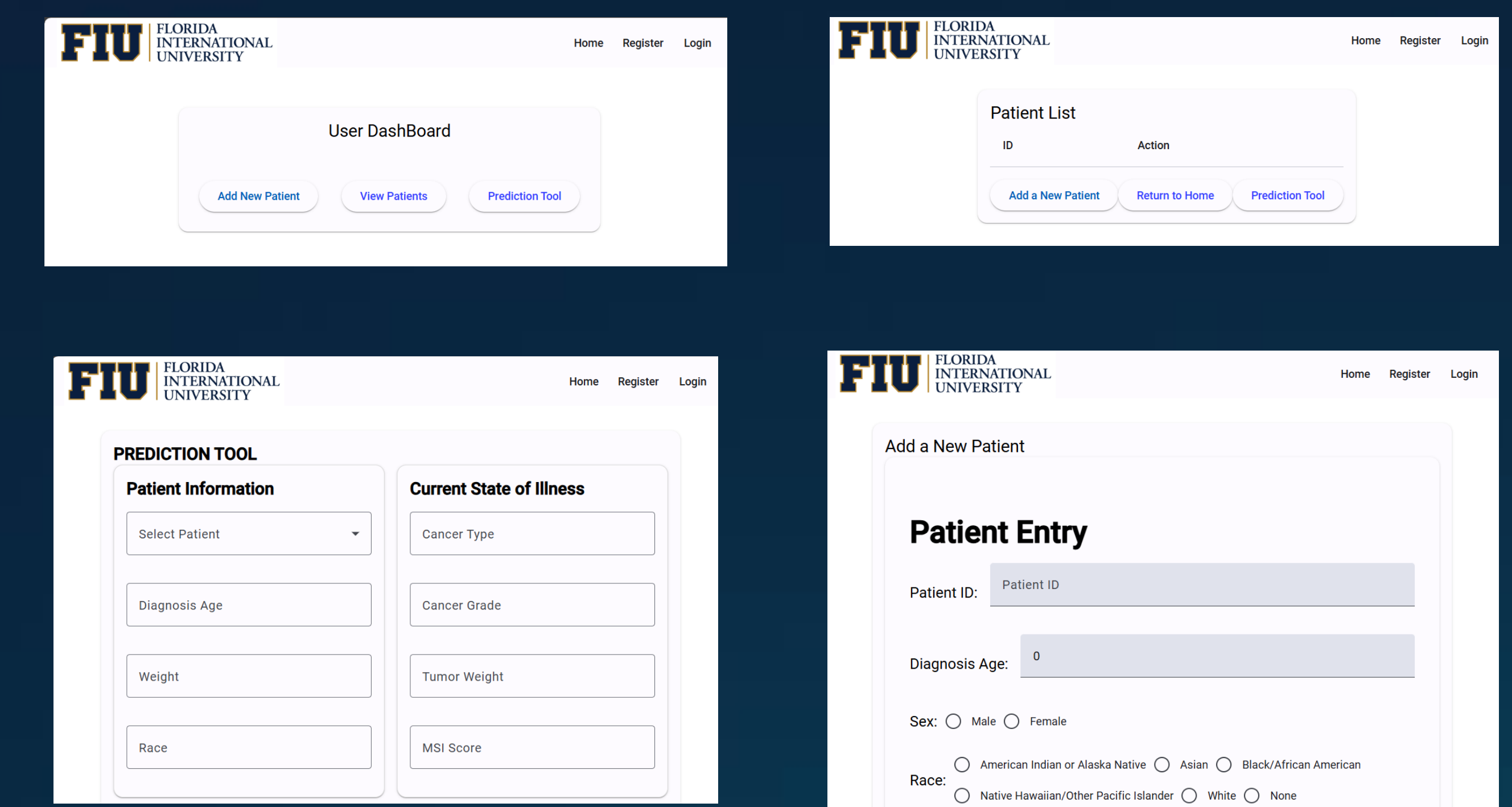
SYSTEM DESIGN



OBJECT DESIGN

- Modular UI Elements – The UI must be modular and easily modified to allow future project collaborators to quickly make changes as needed.
- Flexible Site Layout – The web app model must support navigation to different pages in an intuitive manner that allows users to quickly and easily generate results.
- Intuitive Web Design – The user experience must flow in a cohesive and thoughtful manner, guiding the user to the next step in the process.

IMPLEMENTATION



TECHNOLOGIES



SUMMARY

A treatment prediction tool was needed to streamline the development of personalized treatment plans and improve patient outcome by predicting the optimal plan for a specific patient's needs.

The tool we created gives medical professionals access to a simple, easy to use dashboard that enables them to manage patient information and prediction results.

REFERENCES

- <https://www.mongodb.com/resources/languages/mean-stack-tutorial>
- <https://expressjs.com/>
- <https://angular.dev/overview>
- <https://nodejs.org/docs/latest/api/>



Engineering
& Computing

ACKNOWLEDGEMENT

The material presented in this poster is based upon the work supported by Dr. Chris Poellabauer. I thank Dr. Poellabauer for his assistance and mentorship that I received throughout the senior design project

FLORIDA INTERNATIONAL UNIVERSITY