AMRITA VISHWA VIDYAPEETHAM

CliniSim

Disease Diagnosis & Patient Interaction Simulator

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Molecular biology & basic cellular physiology
Ethics, innovative research, businesses & IPR

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PRESENTATION LAYOUT

- Problem Statement
- Objective
- Key Ethical concerns and IPR terms
- Progress till first review
- Progress so far
- Cited literature and patents on Ethics and IPR
- Future Goals
- Timeline
- References

PROBLEM STATEMENT

How can we develop an **interactive user interface** that can help doctors to practice on simulation for dealing with real-world patients while brushing their clinical as well as patient handling skills?

OBJECTIVES

1. To make an interactive user interface that can simulate clinical conditions for the medical students to practice before their clinical postings.
2. To add up cases of different diseases and allowing user to proceed with the tentative treatment for the particular disease, as per his/her knowledge.
3. To provide feedback, after the clinical simulation session is over, upon the accuracy of selected procedures and drugs.

KEY ETHICAL CONCERNS

1

Consent & Autonomy

Virtual patients shall be designed using anonymized or synthetic data with which real patients' privacy will not be violated.

2

Non-Maleficence

The simulator should supply trainees with accurate, evidence-based information and should not mislead them.

3

Equal Access and Justice

The same tools need to be available to trainees in various parts of the world and institutions regardless of resources.

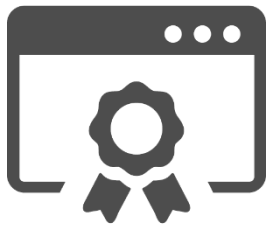
4

Data Ownership and Usage Rights

It's unclear who owns the training data generated by the simulator & it cannot be misused commercially.

KEY TERMS IN IPR

1



Software Licensing

Deciding whether the tool will be open-source (freely available) or proprietary (commercially licensed).

2

Data Protection

The patient data used in training is anonymized and complies with regulations such as GDPR or HIPAA.

3

Software Patenting

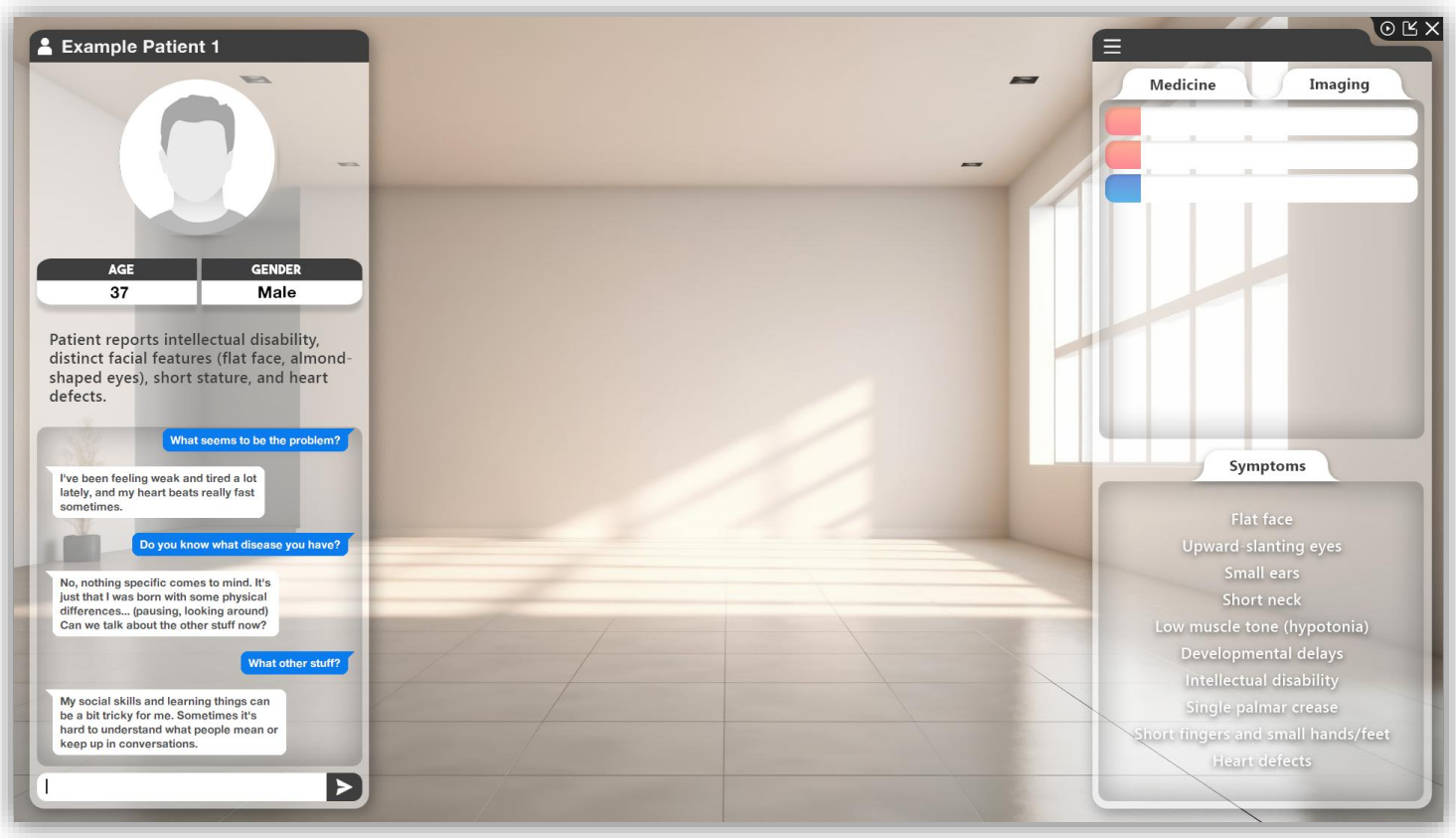
In India, software can be patented if it is part of an invention that is new, useful, non-obvious, and has a technical improvement.

4

Copyright & Trademark

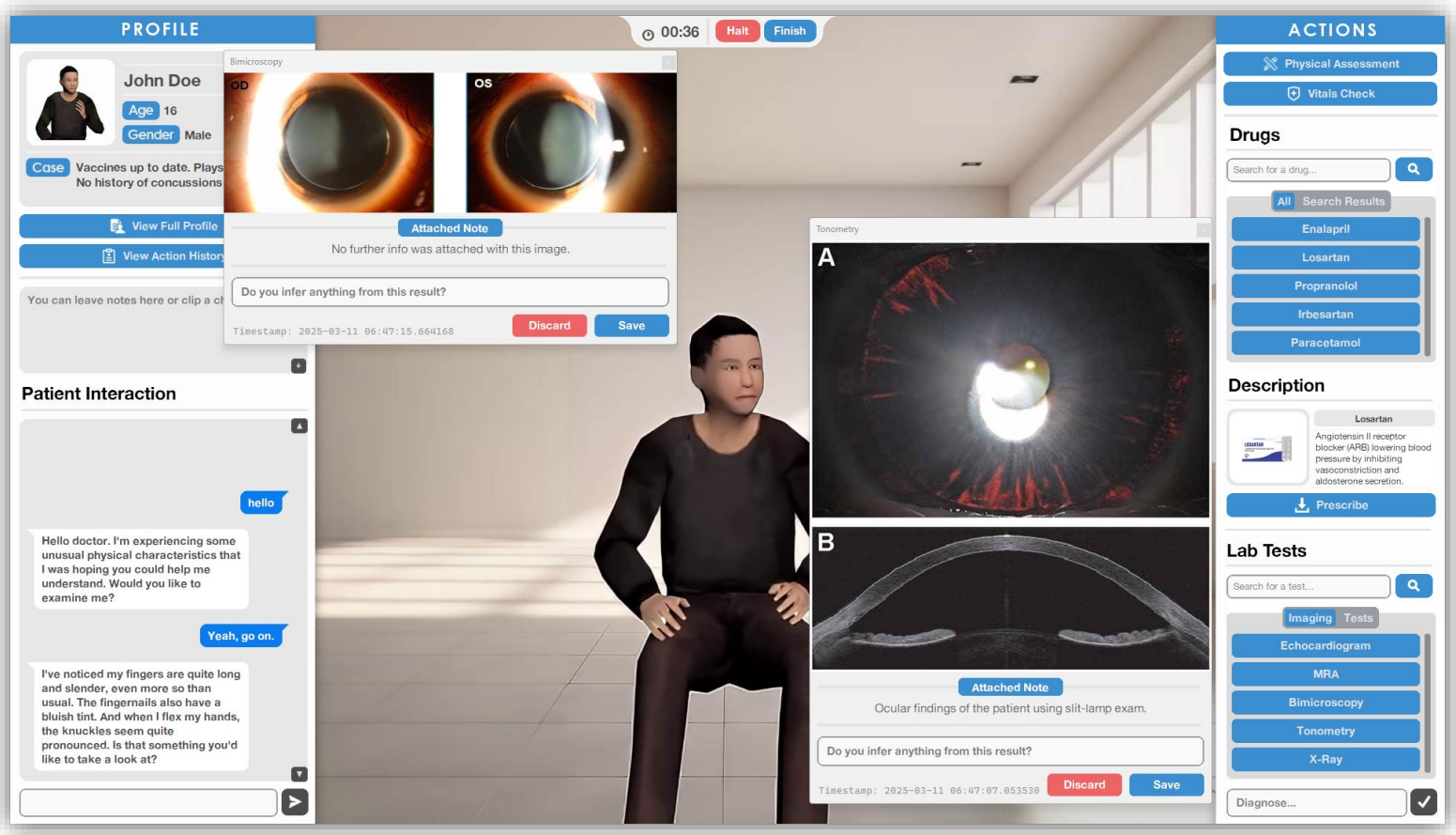
Copyrights protect the creative elements of the software itself while trademarks protect the brand identifiers, like the institution behind it.

PROGRESS TILL FIRST REVIEW



- We have implemented the **Chatbot** that is able to interact with the user.
- The model runs on **LLAMA 3.2** which would be fed the patient's history based on selected case.
- We have also made considerable progress in the UI and are working on it's final design.
- Interface is partially coded with some interactive elements.

PROGRESS SO FAR



- We have done a complete re-design of the User Interface since the first review to improve versatility.
- Interface is fully coded and functional. The implementation for **Marfan Syndrome** has been completed.
- The software is able to grade the user based on how they perform during the simulation.

CITED LITERATURE ON ETHICS AND IPR

I. **Ethical Challenges and Frameworks in AI-Driven Software Development and Testing**

- Briefs about the ethical practices related to AI, stating AI as dual edged.

II. **Revolutionizing Rural Healthcare in India: AI Powered Chatbots for Affordable Symptom Analysis and Medical Guidance**

- Proposes a chatbot that can be used as a pre-diagnostic tool and can help you check for symptoms for a disease or vice versa.

III. **ViTAWiN- Interprofessional Medical Mixed Reality Training for Paramedics and Emergency Nurses**

- Provides a mixed VR and mannequin practice for the paramedics and nurse trainees.

IV. **Evaluation of Interprofessional Learning Among Medical and Pharmacy Students Using a Virtual Patient Simulation**

- Gives the VR platform to practice on the diagnosed disease taken as a case, provided quiz related to diagnosed disease.

CITED PATENTS FOR IPR

1. **Distributed medication delivery system and method having autonomous delivery devices.**

   - Patented on: **APR 10, 2018**

   - Patent status: ACTIVE

2. **Technological devices and systems and methods to use the same to obtain biological information.**

   - Patented on: **JUNE 20, 2012**

   - Patent status: ABANDONED

FUTURE GOALS

- To add more number of cases in interface, for example, down syndrome.
- To make the interface more interactive and engaging by enhancing the features on interface.
- Providing feedback after each case is done with simulation by analyzing the steps taken wrong and steps could be taken alternatively.

PROPOSED TIMELINE

Jan 3rd week

Research about existing methods, literature survey and data collection.

First Review

Feb 1st week

Feb 3rd week

Interface deployment, ethics research and documentation

Tentative 2nd Review

March 1st week

March 4th week

Completion of the application front-end and back-end.

Final testing, integration, and documentation completion.

April 1st week

April 2nd week

Tentative final review

REFERENCES

1. Haut, Kurtis, et al. "Validating a virtual human and automated feedback system for training doctor-patient communication skills." 2023 11th International Conference on Affective Computing and Intelligent Interaction (ACII). IEEE, 2023. – [ ]

2. Ali, Mohammad Rafayet, et al. "Novel computational linguistic measures, dialogue system and the development of sophie: Standardized online patient for healthcare interaction education." IEEE Transactions on Affective Computing 14.1 (2021): 223-235. – [ ]

3. Webb, Katie, et al. "Can a mobile app improve the quality of patient care provided by trainee doctors? Analysis of trainees' case reports." BMJ open 6.9 (2016): e013075. – [ ]

4. Ziv, Amitai, et al. "Simulation-based medical education: an ethical imperative." Simulation in Healthcare 1.4 (2006): 252-256. – [ ]

5. Polivka, Barbara J., et al. "Efficacy and usability of a virtual simulation training system for health and safety hazards encountered by healthcare workers." Games for health journal 8.2 (2019): 121-128. – [ ]

Thank You