

Heaven's Light Is Our Guide



Rajshahi University of Engineering and Technology

Department of Mechatronics Engineering

Course No. CSE-2188

Course Title: Software Engineering Sessional

Group-10

Lab report on,

Web Browsing Using Web Cam

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Introduction:

Web browsing using web cam Application is a project developed under the course CSE 2188, Software Engineering Sessional. This software is developed by a group of students from the department of Mechatronics Engineering, Rajshahi University of Engineering & Technology (RUET). The vision of the Application is to make web browsing and our daily life easier. This project is from Group-10 and the members are Md. Jubair Ahamed -1908049, Md. Faisal Arafat -1908050, Md. Abul Basar Roky -1908051, Md. Musfiqur Rahman -1908052, Shahriar Rahman -1908053, Mohsiul Mumit Alik -1908054. As we know programming is the process of performing particular computation by designing, writing codes and building executable programs. Programming language is any set of rules that tells the computer what to do. Python is a very popular programming language which has many applications such as web development, networking, database access and software & game development. The application that we developed is a very simple but this can make our life easier and we made this using python.

Objective

The main objective of the proposed software system is to develop an alternative to the regular and traditional mouse system to perform and control the mouse functions, and this can be achieved with the help of a web camera that captures the hand gestures and hand tip and then processes these frames to perform the particular mouse function such as left click, right click, and scrolling function.

Features:

- Checking social media sites/websites without using Mouse
- Reading books /PDF files
- Multitasking

Language & Platform:

- Python
- PyCharm

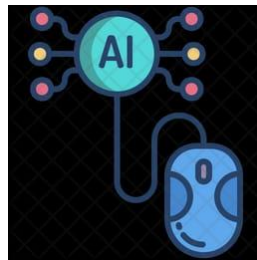


Libraries & Packages:

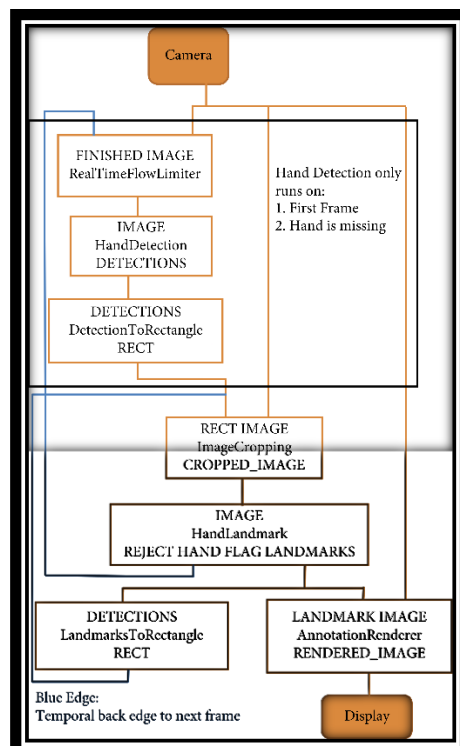
- OpenCV - For image processing and drawing
- Mediapipe - For Hand Tracking
- Autopy - For controlling the mouse movement and click
- NumPy- For solving multi-dimensional array



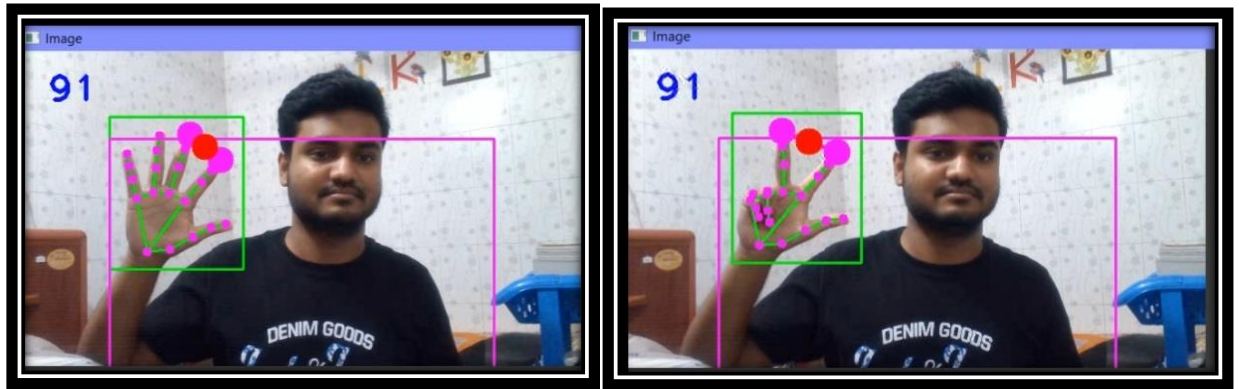
Logo of our software:



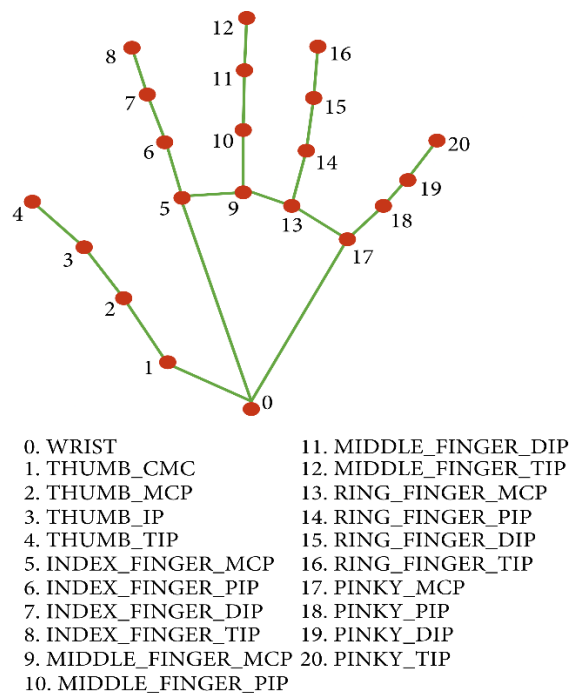
Roadmap for our software:



Software uses real time photos:



Land marks for our software:



Applications of our software:

- The proposed model has a greater accuracy of 99% which is far greater than the that of other proposed models for virtual mouse, and it has many applications
- Amidst the COVID-19 situation, it is not safe to use the devices by touching them because it may result in a possible situation of spread of the virus by touching the devices, so the proposed AI virtual mouse can be used to control the PC mouse functions without using the physical mouse
- The system can be used to control robots and automation systems without the usage of devices
- 2D and 3D images can be drawn using the AI virtual system using the hand gestures
- AI virtual mouse can be used to play virtual reality- and augmented reality-based games without the wireless or wired mouse devices
- Persons with problems in their hands can use this system to control the mouse functions in the computer
- In the field of robotics, the proposed system like HCI can be used for controlling robots
- In designing and architecture, the proposed system can be used for designing virtually for prototyping

Limitations and future scope:

The software mouse has some limitations such as small decrease in accuracy of the right click mouse function and also the model has some difficulties in executing clicking and dragging to select the text. These are some of the limitations of our software, and these limitations will be overcome in our future work.

Discussion:

The project was completed with the help of all the group members. We had faced some difficulties while working on this project such as we were unable to scroll any page or website using the webcam. Also, we don't have any UI

Conclusion:

The aim for this project was to create something new as we are beginner and we were successful in doing so. We had chosen python as our preferred programming language. We didn't know much about python when we started the project but now, we have gained a good idea of python language and completed our software and submit successfully.

References:

- [1] Shriram, S., et al. "Deep Learning-Based Real-Time AI Virtual Mouse System Using Computer Vision to Avoid COVID-19 Spread." *Journal of Healthcare Engineering*, Hindawi, 25 Oct. 2021, <https://www.hindawi.com/journals/jhe/2021/8133076/>.
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- [3] Ijaset. "IJRASET Journal for Research in Applied Science and Engineering Technology." *AI Virtual Mouse Using Hand Gesture Recognition*, <https://www.ijraset.com/research-paper/ai-virtual-mouse-using-hand-gesture-recognition>.
- [4] Virtual Mouse - Universiti Tunku Abdul Rahman. <http://eprints.utar.edu.my/2262/1/IA-2016-13ACB07377-1.pdf>.