

KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE

Opp : Yerragattu Gutta, Hasanparthy (Mandal), WARANGAL - 506015, TELANGANA, INDIA

काकतीय प्रौद्योगिकी एवं विज्ञान संस्थान, वरंगल - ५०६०१५, तेलंगाना, भारत

కాకతీయ సాంకేతిక విజ్ఞాన శాస్త్ర విద్యాలయం, వరంగల్ - ౫౦౬ ౦౧౫ తెలంగాణ, భారతదేశము

(An Autonomous Institute under Kakatiya University, Warangal)

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website: www.kitsw.ac.in

E-mail: principal@kitsw.ac.in

☎ : +91 9392055211, +91 7382564888

Name of the Department: Computer Science and Engineering (Networks)

Name of Research and Education center: CSE (AIML)

Research & Education Center **CSE(Artificial Intelligence and Machine Learning)**

About the Center:

The Research & Education Center for Artificial Intelligence and Machine Learning (AI & ML) serves as a dynamic hub for exploring and innovating in areas such as deep learning, natural language processing, and predictive analytics. With cutting-edge facilities and expert faculty, it fosters groundbreaking research in AI & ML. The center empowers students with hands-on experience, equipping them with skills to tackle real-world challenges. Faculty, researchers and students collaborate in this dynamic environment to create intelligent systems, enhance decision-making processes, and solve complex real-world problems across diverse domains, driving advancements in the field of AI & ML.

The primary functions of the center:

- Pioneering cutting-edge research in artificial intelligence and machine learning (AIML)
- Advancing the theoretical foundations, algorithms, and practical applications of AIML.
- Offering hands-on experience and practical skills development for students
- Facilitating interdisciplinary collaboration among researchers and faculty
- Serving as a hub for networking and collaboration within the AIML community



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Major equipments:

Nodes: 77 + 1 Server

Cost of new equipment added since 2018-19: Rs: 50,88,874=00



Minor equipment details: N/A

Major software list with description:

Operating Systems:

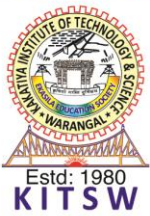
Windows 11 Operating System,
Redhat Linux OS,

Application software:

Dev-C++
Jdk1.8
Python (Anaconda) framework
Oracle10g
Android Studio,
XAMP
MS-Office,
Adobe PDF Reader

Types of projects / research carried out with description:

- 1. Machine Learning /Deep Learning Algorithms:** Developing and optimizing algorithms for classification, regression, clustering, and reinforcement learning, applicable in various domains such as finance, healthcare, and marketing
- 2. AI for Personalized Healthcare:** Developing AI-based healthcare solutions tailored to individual patients' needs, including predictive diagnostics, personalized treatment plans, and patient monitoring systems.



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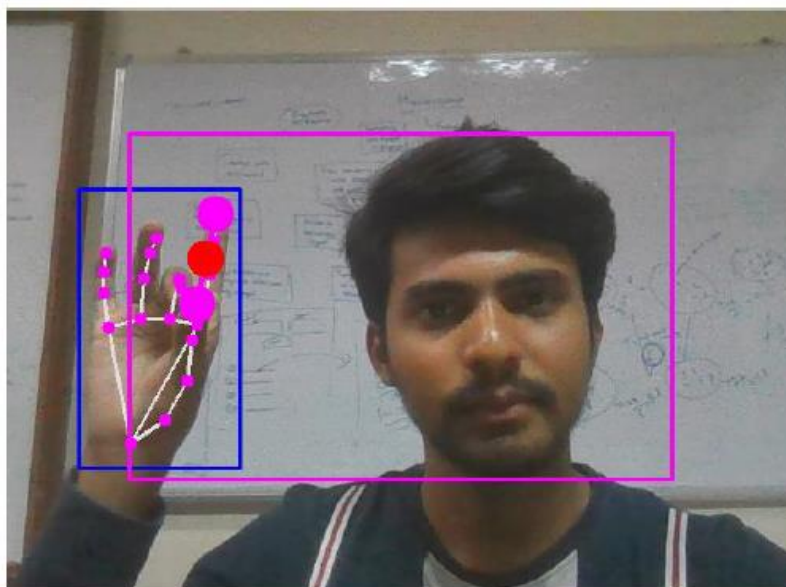
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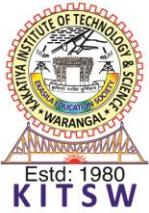
3. **AI-driven Social Network Analysis:** Analyzing social network data using AI techniques to uncover patterns, trends, and relationships, and to understand social dynamics, influence propagation, and community detection.
4. **AI-enabled Environmental Monitoring:** Utilizing AI and ML algorithms for environmental monitoring and conservation efforts, including applications in species identification, habitat monitoring, pollution detection, and climate change analysis.
5. **AI-driven Simulation and Modeling:** Utilizing AI and ML algorithms to create realistic simulations and predictive models in diverse areas, including climate modeling, urban planning, epidemiology, and virtual prototyping.
6. **AI-enabled Assistive Technologies:** Developing AI-powered tools and devices to assist individuals with disabilities or special needs, including applications in mobility assistance, communication aids, and cognitive support systems.
7. **AI-driven Decision Support Systems:** Designing AI systems to assist decision-makers in various domains, such as healthcare, finance, and policy-making, by providing data-driven insights and recommendations.

Photographs of working models / application software developed with description:

1. AI-BASED REAL -TIME VIRTUAL MOUSE USING HAND GESTURES AND OPEN CV

Left Click Gesture:





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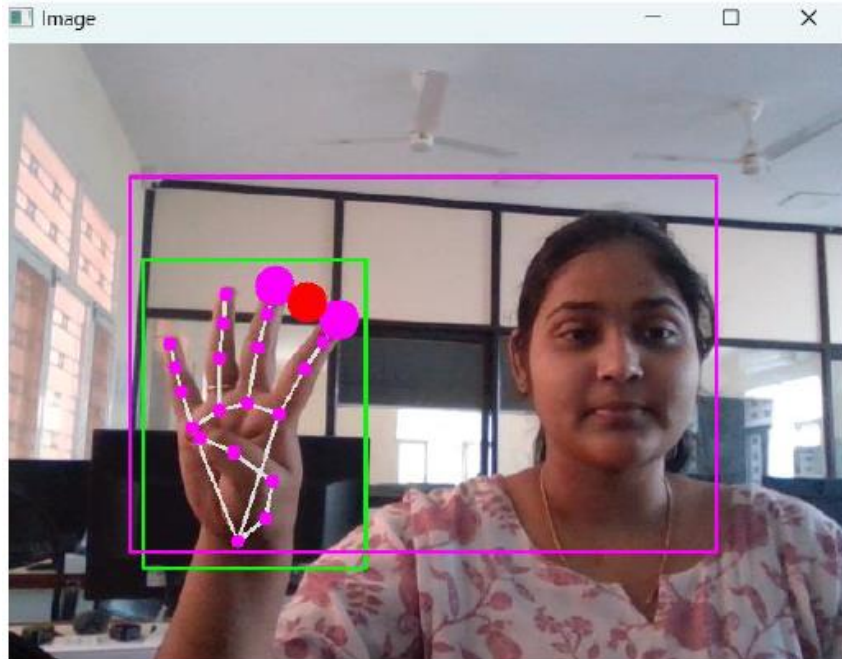
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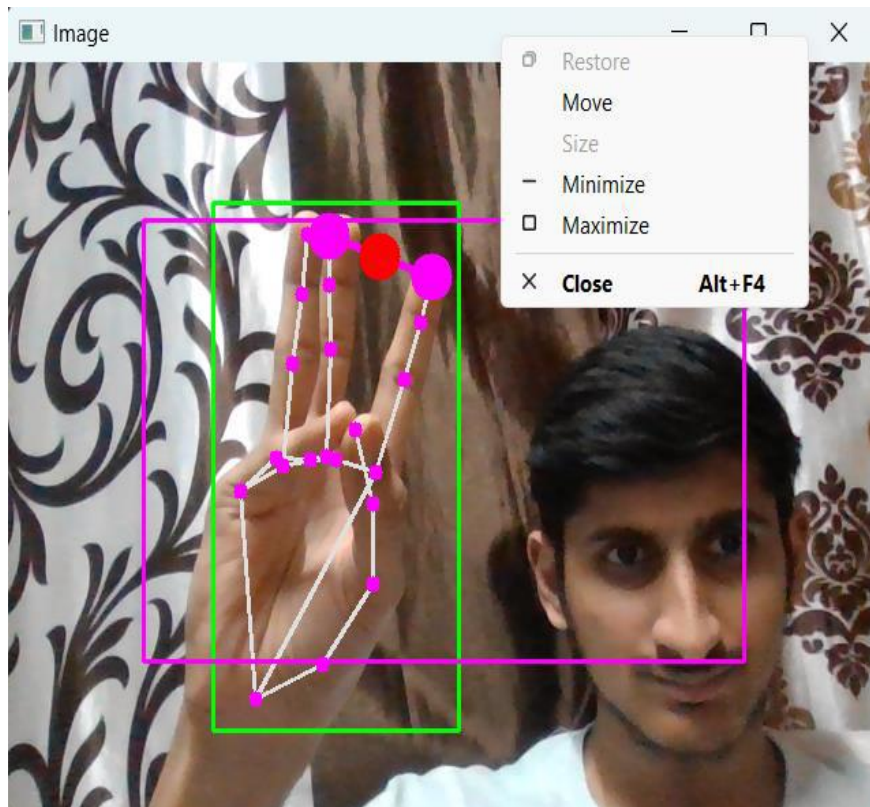
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ZOOM IN:



RIGHT CLICK GESTURE:





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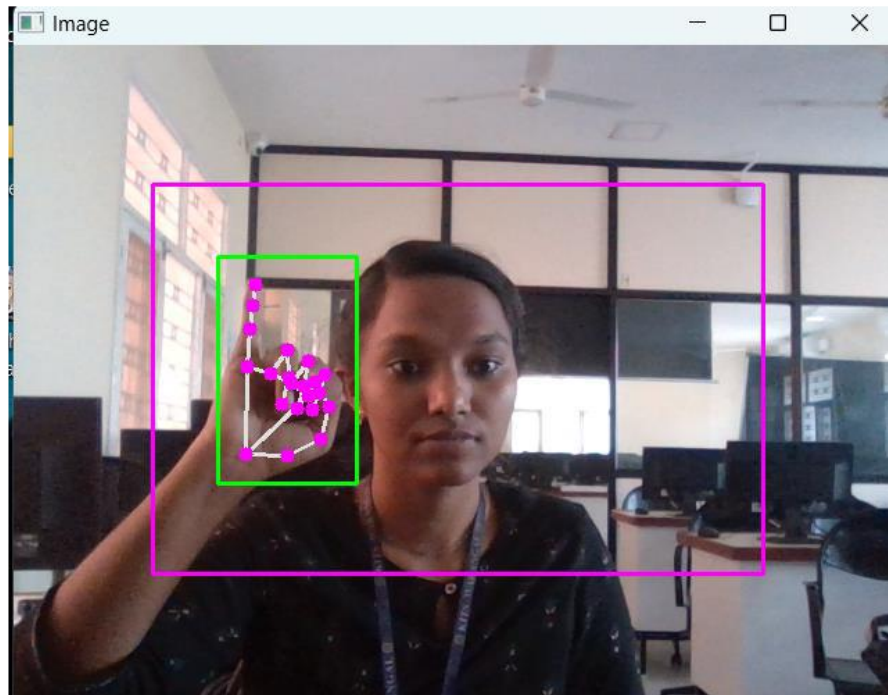
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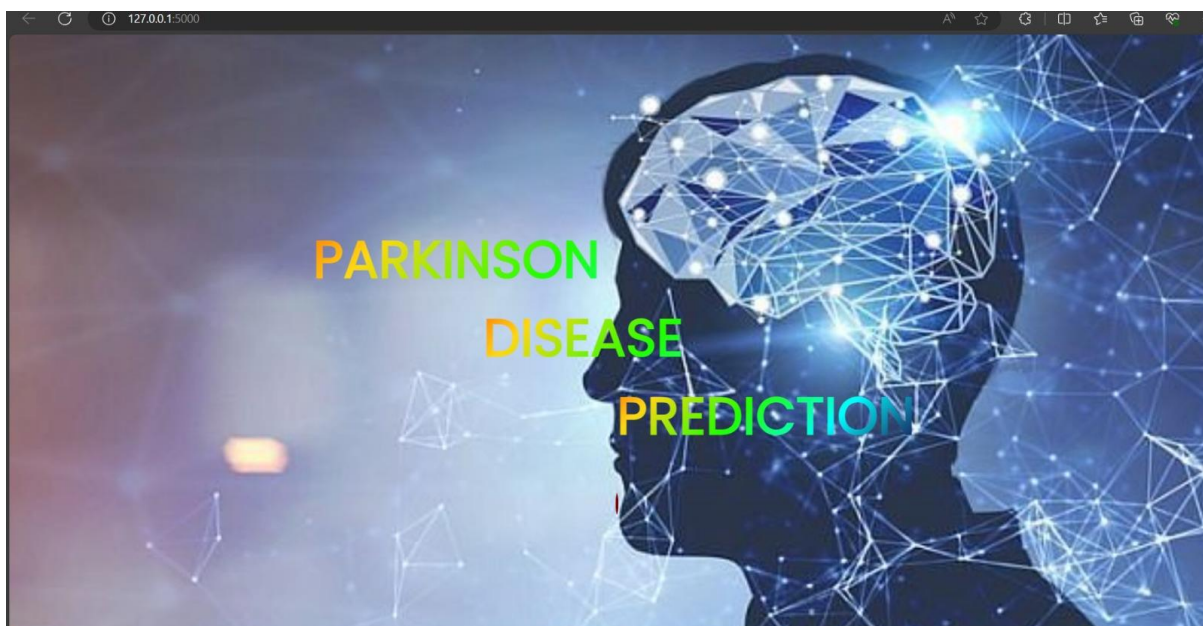
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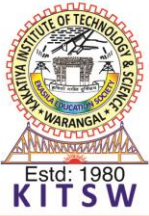
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VOLUME CONTROL:



2. AN ENHANCED DEEP LEARNING APPROACH FOR EFFICIENT PREDICTION OF PARKINSON'S DISEASE





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Detecting Parkinson's Disease

Parkinson's disease (PD) is a prevalent neurodegenerative disease affecting about 1% of the world population over the age of 55 (Nussbaum and Ellis, 2003). About five million people worldwide are estimated to have PD. PD Prevalence is expected to double by the year 2030 . Parkinson's disease (PD) patient care is limited by inadequate, sporadic symptom monitoring, infrequent access to care, and sparse encounters with healthcare professionals leading to poor medical decision making and sub-optimal patient health-related outcomes. Recent advances in digital health approaches have enabled objective and remote monitoring of impaired motor function with the promise of profoundly changing the diagnostic, monitoring, and therapeutic landscape in PD.

Healthy
Parkinson's Disease

Prevention is better than cure!

Parkinson's disease

Progressive disorder of the central nervous system; affects movement and communication

- ~ About 6 million people affected
- ~ Usually occurs after age of 50
- ~ Economic impact in the United States estimated at \$10.6 billion

Main symptoms

- Tremors
- Slow movement
- Rigidity

Other problems

- Eyes
- Swallowing
- Sleep, dizziness, falls
- Speech/communications
- General pain
- Skin, scalp, sweating
- Bladder and bowel
- Restless leg syndrome

CENTRAL NERVOUS SYSTEM

Dopamine
Essential for motor skills

Substantia nigra
Dopamine-producing cells. The cells die, less dopamine is produced

Striatum
Coordinates movement

Mental health

- Anxiety
- Depression
- Hallucinations and delusions
- Memory

Current treatments

- L-dopa → converts to dopamine in the brain. Less effective after 4 - 6 years. Side effects include nausea, confusion and anxiety
- Drugs to act against enzymes that break down dopamine
- Deep brain stimulation → electrode implants in brain to send impulses. Helps to act against symptoms

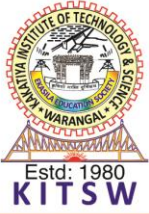
Future hopes

- Gene therapy**
Introduce corrective DNA to the striatum, and induce the brain to synthesize replacement dopamine
- Stem cells**
Aim to replace lost dopamine-producing cells using stem cells

*American Journal of Managed Care, quoted by Parkinson's Research Association
Source: www.parkinsons.org/parkinsons.org.uk

The Hoehn and Yahr Scale is the most commonly-used scale to measure the severity of Parkinson's symptoms, and classifies patients in the following stages:^(Hoehn 2004)

Stage 1	Stage 1.5	Stage 2	Stage 2.5	Stage 3	Stage 4	Stage 5
Unilateral movement only	Unilateral and axial involvement	Bilateral symptoms, no impairment of balance	Mild bilateral disease with recovery on pull test	Mild to moderate disease, Physically independent	Severe disability, still able to walk or stand unassisted	Wheelchair-bound or bedridden unless assisted



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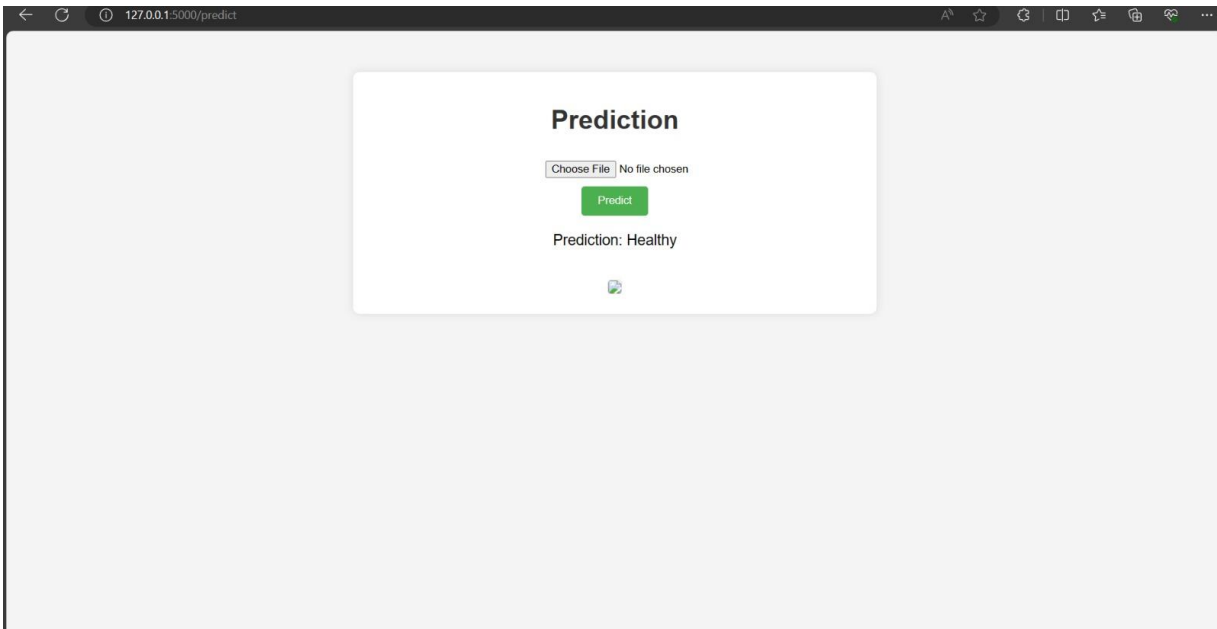
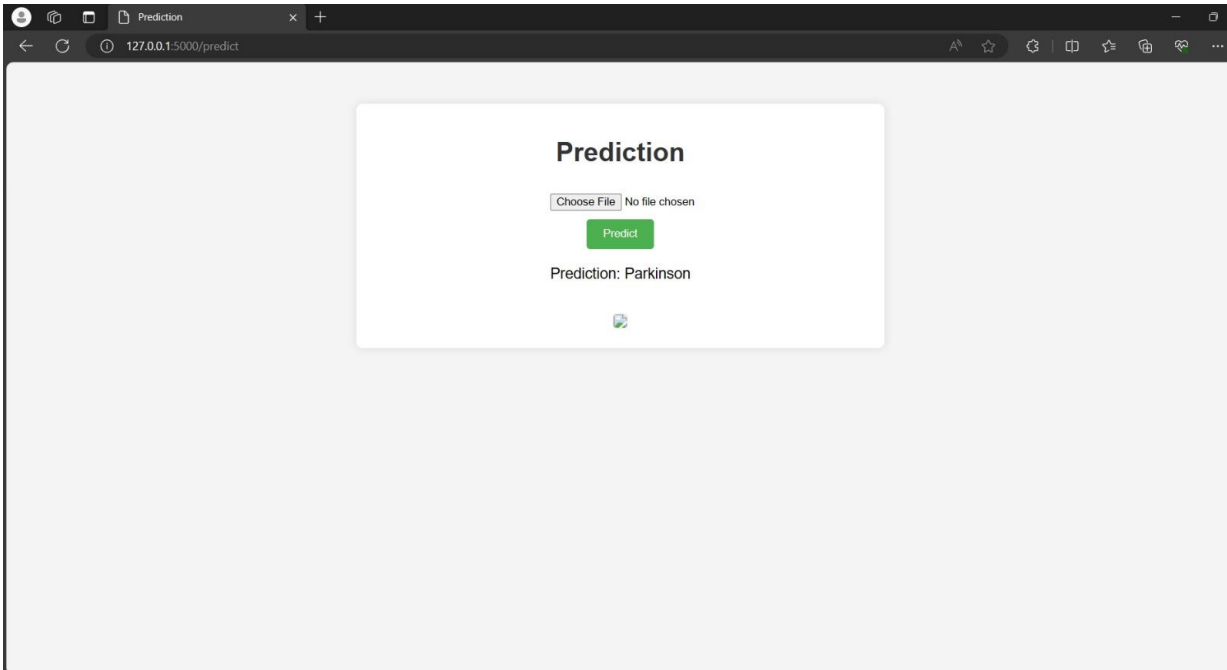
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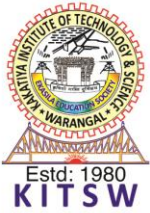
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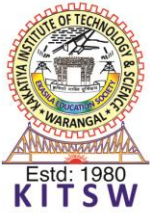
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3. MALWARE DETECTION & CLASSIFICATION USING VISUALIZATION TECHNIQUES



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Details of Faculty incharge for Research and Education Center: (Photo, Contact details)



Dr.Jothi Prabha Appadurai

Associate Professor

Dept. of CSE(Networks)

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