Question : A twenty (20) minute video presentation (accompanied by an abstract in KiSwahili, English, one indigenous African language) on any invention or innovation in his/her field of study.

**SIGN LANGUAGE DETECTION SYSTEM**

**ABSTRACT IN ENGLISH.**

The Sign Language Detection System utilizes machine learning, particularly Action Recognition, to interpret sign language for users. For many in this community, sign language serves as their primary means of communication. Unlike most hearing individuals who learn spoken languages as their first language, deaf individuals must acquire sign language. Communication is pivotal for expressing emotions, ideas, and resolving conflicts among people. Language, whether through symbols, gestures, or speech, is fundamental for effective communication, necessitating a common language among all parties involved.

The primary objective of this project is to create an efficient deep learning model capable of recognizing and interpreting english sign language into letters. This proposed system employs a convolutional neural network model, leveraging media pipe holistic to identify crucial points that is hand gestures. The project entails collecting and preprocessing data, as well as creating labels and features for training and testing purposes.

Ultimately, the goal is to provide a learning tool for abled individuals to understand sign language, thereby improving communication between the two groups. Unlike existing systems that primarily identify sign language accurately, this proposal introduces real-time recognition from live video feeds, enhancing interactivity by detecting actions in sequences.

**ABSTRACT IN KISWAHILI.**

Mfumo wa Kugundua Lugha ya Ishara hutumia kujifunza kwa mashine, hasa Kitendo cha Kutambua Kitendo, kutafsiri lugha ya ishara kwa watumiaji. Kwa wengi katika jumuiya hii, lugha ya ishara ndiyo njia yao kuu ya mawasiliano. Tofauti na watu wengi wanaosikia wanaojifunza lugha zinazozungumzwa kama lugha yao ya kwanza, viziwi lazima wajifunze lugha ya ishara. Mawasiliano ni muhimu kwa kueleza hisia, mawazo, na kutatua migogoro kati ya watu. Lugha, iwe kupitia ishara, ishara, au usemi, ni muhimu kwa mawasiliano bora, na hivyo kuhitaji lugha ya pamoja kati ya pande zote zinazohusika.

Madhumuni ya kimsingi ya mradi huu ni kuunda muundo bora wa kujifunza kwa kina wenye uwezo wa kutambua na kutafsiri lugha ya ishara ya Kiingereza kwa herufi. Mfumo huu unaopendekezwa unatumia muundo wa mtandao wa neural wa kushawishi, unaotumia mfumo mzima wa bomba la media kutambua pointi muhimu ambazo ni ishara za mkono. Mradi unajumuisha kukusanya na kuchakata data mapema, pamoja na kuunda lebo na vipengele kwa madhumuni ya mafunzo na majaribio.

Hatimaye, lengo ni kutoa zana ya kujifunzia kwa watu wenye uwezo kuelewa lugha ya ishara, na hivyo kuboresha mawasiliano kati ya vikundi viwili. Tofauti na mifumo iliyopo ambayo kimsingi hutambua lugha ya ishara kwa usahihi, pendekezo hili linatanguliza utambuzi wa wakati halisi kutoka kwa milisho ya video ya moja kwa moja, kuboresha mwingiliano kwa kugundua vitendo katika mfuatano.

**ABSTRACT IN KIKAMBA.**

Nzĩa ĩla ĩtũmĩawa nĩ mũndũ kũandĩka na kĩthyomo kya ala matew'aa nĩ nzeo mũno, na nĩtũmĩkaa ĩla ũkũelesya andũ angĩ kĩla ũkwenda makwatye. Andũ aingĩ ma mbaĩ ĩsu matũmĩaa kĩthyomo kya ala matew'aa. Kĩvathũkany'o na andũ ala angĩ matew'aa, ala methĩawa na thĩna ũsu nĩmaĩle kũtũmĩa kĩthyomo kya ala matew'aa. Kũea ngewa nĩ ũndũ ũmwe katĩ wa maũndũ ala mũndũ waĩle kwĩka nĩ kana ew'ane na ũla ũngĩ. Andũ asu nĩmethĩawa matonya kũtũmĩa kĩthyomo kya ala matew'aa, kya ala matesĩ kũneena, kana o kya ala maneenaa namo. Kĩeleelo kĩnene kya wĩa ũsu nĩ kũseũvya nzĩa nzeo ya kũsoma yĩtawa deep learning ĩla ĩtũmĩawa kũalyũla na kũalyũla mavuku ma kĩthyomo kya ala matew'aa kwa kĩthyomo kya Kĩsũngũ. Nzĩa ĩsu ya kũandĩka ũvoo yĩthĩawa ĩitũmĩa nzĩa syĩ kĩvathũkany'o sya kũandĩka, na nzĩa isu nĩsyo syambĩĩw'e nĩ asomi ma Mbivilia. Kĩeleelo kya kwĩka maũndũ asu nĩ kũmbany'a na kũseũvya syĩndũ ila itũmĩawa wĩanĩ wa kũseũvya syĩndũ, kũseũvya mĩtĩ ĩla ĩtũmĩawa wĩanĩ ũsu, na kũseũvya syĩndũ ingĩ itonya kũtũmĩwa wĩanĩ ũsu. Kĩeleelo kĩnene kya kwĩka maũndũ asu nĩ kũtetheesya andũ ala me na thĩna wa kwĩw'a maelewe kĩthyomo kya ala matew'aa nesa nĩ kana kana syana ila syĩ na thĩna ũsu itonye kũneena nasyo. Kĩvathũkany'o na nzĩa ila syĩ kw'o sya kũmanya kĩthyomo kya ala matew'aa, nzĩa ĩla ĩtũmĩawa vaa nĩ ĩla mũndũ ũkwenda kũmanya kĩla kĩendeee isesenĩ sya kũea ngewa Indanetinĩ (video conferencing), na ĩla mũndũ ũkwenda kũmanya maũndũ mana nthĩnĩ wa isesenĩ isu sya kũea ngewa.