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ProjectName	Project-Real-TimeCommunicationSystemPoweredbyAIforSpeciallyAbled

1.BasedRealTimeCommunicationforPhysicallyandSpeechDisabledPeople(OngChin Ann,MarleneValeriuLu–2019)

Communicationisasocialprocessofexchanginginformationfromoneentitytoanotherinverbalandnon-verbalform.Itdefinesourexistenceanditisanimportantinstrumentthatconnectspeopletogether.Itcomesnaturally asarawskillembeddedinmostpeopleatbirthandweacquiredthe

waysofcommunicationthroughcognitivelearning.Communicationisthebasis,whichdrivestheprocessofdevelopmentinallthefields(Manohar,2008)anditistheverycoreofourcivilisation.Theabilitytocommunicateallowsusto expressemotion,feelings,conveyourthoughtsandideasaswellastorelateourexperiences.Itplaysanimportantrol einthedis-seminationofinformationandsharingofknowledgeespeciallyintheacademicarena.Researchhasfoundthathumans tartedtolearnhowtocommunicatewitheachothersincetheyarebornnotonlythroughspokenand

writtenlanguagesbutalsobodygesture,posture,facialexpressionandeyecontacts(Busso,etal.,2004;Cohen,Grag& Huang,2000).

Communicationskillmightcomeasanaturalabilityinmajorityofpeople.However,therearesomepeopleinfli ctedwithsomeformofphysicaldefectswhichaffecttheirabilityto

communicate.Oneofthemoreseveredisabilitiesisknownas“cerebralpalsy”,acongenitaldisorderatbirth whichcausesabnormalityintheirMotorsystem.Itaffectstheirmuscle

movementandcoordination,learningandSpeechabilities.Theirmalfunctionedmotorsystemcausesanuncon trollableandinvoluntarymovement.Theyareunabletocontroltheiroralfacialmuscles,thusaffectstheirability toperformfacialexpressionappropriately.

Fromthelimitationoftheexistingtoolsreviewed(Novita,2006;Macsolvers,2009;Standup,2006;UniversiteitvanA msterdam,2008;Crestwood,2009;Sci-enceDaily,2008),thereisstillapressingneedformoreeffectiveandefficienttoolstoalleviatethisproblem.Onethepos siblemethodsaretoimplementafacialexpres-sionrecognitionsystemtopredictordeterminetheemotionalstateofadisabledpersonthroughhisexpressionproject edonhisface.biometricsinformationsystemcanbeemployedasameanstodetectandclassifythephysiologicalaspecto fapersoninrealtime.FrancoandTreves(2001)furthersupportthenotionthatfacialexpressioncanbeusedforhumanco mputerinteractionandusabilityenhancement.

Basedontheproblemstatementsdeliberatedabove,weproposeanimprovedreal-time communicationsystemusingmachinelearningandcomputervision.Theaimistocreatea communicationchannelbetweenthespeciallyabledandthesociety,sotheycanexpressthere feelings,thoughtsandunderstandotherpeople'sfeelingsandthoughtsthroughrealtimecommunicati onandfacialexpressions.

2.Systematicreviewofcomputervisionsemanticanalysisinmedical(AntonioVictor

AlencarLundgren,ByronLeiteDantasBezzerra–2021)

Medicaldiagnosingtechniqueshavefascinatedusforalongtime.Ithasbeencommonforustousetheminourda ilylifeandimplementthesetechnologies.Machinelearningandespecially

computervisioncontributealotinmedicalscience,whichmakedifferentdifficulttaskseasyfordoctorsandmor etolerableforpatients.Theyarewidelyusefulinearlydetectionofdisease,andhenceareavaluabletooltosavehu manlife.Cardiographictechniquesareamustforoldageandinfantsafety.

Theseinclude:

.**Retinoscopy-**

Theyalthoughprimitiveinapproachareamustonceinalifetimeandretinoscopyhavemadeyetsuc cessfultomeasureactivitiesofrodandconereceptorsinoureyes.Retinahasthreedistinctareasforc olors-erythrolabe,chlorolabeand

cyanolabe…whichareanalogicaltopixelfixationandidentificationalgorithmsonmachinele arning.

.**Tumordetection-**

Cancerisspreadingintheworldaffectingbillionsoflivesbothintermsoflifeandmoney…machine learningdiagnosingsystemsapplytheir

identificationsystemstofurtherdevelopaccuratedetectionintermsofsize,location,qualityofsuch tissueswhicharesuspectedtobecomemalignantuncontrolledgroupoffastdividingcells.

.**CTscan-CTscan–**Averycommontermforcancerpatientswhichuses

electromagneticradiationsundermanuallyoperatedcontrolledcomputervision

gratingswhicharesoaccuratethatitcanmeasureapigmentcalledc-125inblood.

3.AsurveyonFacialEmotionRecognitionTechniques(FelipeZagoCanal,TobiasRossiMuller,GustavoGino Scotton–2022)

Facialexpressionsrecognitionisanabilitytorecognizepeoplebytheirfacialcharacteristicanddifferentiateitwithoneanother.Humanisbornwiththeabilitytorecognizeotherpeopleeasilybyidentifyingtheirfacialfeaturessuchasshape,appearance,skintextureandskincomplexion.Otherthanthat,humansalsohavetheabilitytoexpress,interpretanddifferentiatefacialexpressions.Theregularrecurringonesarehappiness,anger,disgust,fear,surpriseandsad(Ekman&Friesen,1978).Thesixfacialemotionsstatedaboveareimportantandplayamajorroleinexpressingemotionaswellasrecognisingfacialexpression(Busso,etal,2004).

Inreallife,interpersonalhumaninteractionareperformednotonlyusingspeechorspokenlanguage,butalsononverbalcuesforexamplehandgesture,bodygesture,facialexpressionandtoneofthevoice.Allthesecuesaresometimesbeingusedforexpressingfeelingandgivefeedback(Busso,etal,2004;Cohen,etAl.,2000).Wecanseehowhumaninteractwitheachotherusingnon-verbalcueseveryday.Forexampleachildcriesinfrontofhismotherbecauseheisnothappyordissatisfiedwithsomething.Otherpeoplemightinterpretitdifferentlythinkingthatthechildmightbeinpain.

Facialexpressioninteractionisrelevantmainlyforcommunitysociallife,teacherandstudentinteraction,credibilityindifferencecontexts,medicineandsoon.Besides,facialexpressionrecognitionisusefulfordesigningnewinteractivedeviceswhichoffersthepossibilityofnewwaysforhumancomputerinteraction-HCI(Franco&Treves,2001).Cohen,etal.(2000)conductedsurveyontheirusersandnoticedthattheyhavebeenthroughtraditionallyHCIconsistsofthekeyboard,mouse,joystick,trackballs,dataglovesandtouchscreenmonitors.

FacialExpressionRecognitionSystem(FER)hasbeenatopicforresearchsinceEkmanandFriesen(1978)whopioneeredthisresearchandworkedfromthepsychologyperspective.Inthepast20years,manyresearchershavetriedtoadopttheirideaandmakeimprovement,innovationandmodificationonfacialexpressionrecognitionbyintroducingdifferenttechniques,mainlyconcentratedontheimprovementintermofaccuracy,efficiency,mobility,andspeed(Kotsia&Pitas,2007).Withalltheenhancementsontechniquesforfacialdetectionandrecognition,thedevelopmentofthefacialexpressionrecognitionhasalsoimproved(Zhan&Zhou,2007).Themostactiveresearchesincomputervisionandpatternrecognitionisfacerecognitioninforensicidentification,accesscontrol,userinterfacedesign(Wang,Plataniotis&Venetsanopoulos,2005),emotionanalysis,interactivevideo,indexingandretrievalofimageandvideodatabase,imageunderstandingandsyntheticfaceanimation(Zhan&Zhou,2007).

Humancaninterpretandgeneratemajorfacialexpressionsbutacomputerisnotbuiltwithanyfacialrecognitionabilityunlessthroughtheuseofsomesoftware.Itisevenmorecomplicatedforthecomputertointerpretirregularfacialexpression,especiallyfromthosesufferingfromcerebralpalsy.Duetotheirdisorder,theydonothavetheabilitytoreflecttheiremotionslikeanormaltypicalperson.Thus,amorenaturalandnaivemethodhastobeemployedforthesystemtoworkbyamanuallabellingoftheimagecapturedwiththeemotionoftheuser.

4.MachineLearningbasedtechniquesindataanalysis(LavanyaVemulapalli,

Dr.P.ChandraSekhar–2018)

Alotmoreapplicationsavailableforusinplaystore,appstore,amazon,etc.,whichare

dependentmachinelearning.Therearesignificantnumberoforganizationsandstartupswhichturntowards optimummachinelearning,andhaveprovedthatinvestinginmachinelearningisthebestintoday'sworld.

GoogleStreetView-Itisapervasivecityimagerydatasetsapplication.

Itisanapplicationfromwhichwecanvirtuallyexplorestreetsofcities.Itusesadense

geosamplingtooltoshowsthestreetsofcities.Streetsarecapturedthroughafleetofvehiclesequippedwitha specializedcamera.

Aftercollectionofphotos,theyaredigitallyprocessedandcombinedtogetherandlookslikeasingleimage.Fro mfilesreportedforprivacy,Googlepixelatedfacesofpedestrianandlicenseplatewhichiscaptured.Webmappi ngtechnologieshavebeenembracedbydisciplinesuchasgeography,archeologyandecology,butalsobyseveral socialscientificdisciplines.Researchersworkinginthedisciplineofgeography,archeology,andecologyquicklyi ncorporatedwebbasedmappingtechnologiesintotheirresearchdesigns.Therearevariousapplicationsofgoo glestreetviewinresearchfield,althoughthenumberstillremainslimited.Itisalsousedforbetter

estimationoffishcatching,estimationofforestrybiomassinIndia,estimationofareaofdifferentregionsorlake s,etc.

Googlealsohelpsinthecriminologicalstudiesthathaveimplementedinthegooglemapsand

streetsviewintheirresearchdesign.Publicandsomelawenforcementagenciesandoffendersarefamiliarwiththe powerofonlinemappingtechnologythroughtheirday-to-daylifeandwork.Thesocialscienceshavealsoembracedweb-mappingtechnologies.Buttogooglemapsstillremainlimitedinsocialscience.Wecanseegooglemapsanditsstree

tviewcanbeusedinvariousfields.Itcanbeusedinmappingordevelopingormaintainingcities'streets.WecanuseG
oogle'sstreetviewtomakeaninfrastructureofbuildingorapartment,park,bridges,water

reservoir,etc.GooglemapsandGooglestreetviewcanbeusedinsomeresearchfieldofdetectingthepop
ulationorurbanizationinsomeareasorthroughouttheglobe.

Uber-
Uberisoneoftheexamplesofusingmachinelearning.Itusesanalgorithmwhichprovidesestimatedtimeandreal-
timelocationonmap,whichisveryusefulandhelpfulforbothdrivers

andriders.Thecompanyisalsodealingwithfraudulentbehaviorlikefacedetectionandinvalidstolencreditcar
ds.

GoogleKeyboard-Almostallandroidhandsetusesgooglekeyboard.Gboardusestheneural

spatialmodeltodeterminethepixelstouchedonthescreenandmakingrelevantwordsandemoji

inhandwritingmode.Itpredictsthenextwordbymatchingthecurrentlytypedwordwithitsdictionaryse
t,whichhelpsusertotypefastandaccurate.

Snapchat-
Snapchatusesmachinelearningtoidentifyorfacedetectiontechnologyforapplyingfiltersonit.Onemaywonder
abouthowSnapchatfilterworks?Itfirstdetectsaface.Thenlocatefacialfeatures,andthencreateameshof3Dmas
k(pyramidalshape)overface.Snapchatnotonlyapplyfiltersbutalsoalistofthingstheyaredoinglike,languagedet
ectionforveryshorttexts,

namesentityrecognitionanddisambiguationusingmultimodalNER(sound,text,etc.),

normalizingtextmisspellings(phonetic,orthographic,semanticrepresentations),emotionanalysis(fromemoji
toactualpictures),speech,musicrecognition(keywordspotting),personalizedneural

conversationalmodels.Wecanusethistechnologyfordetectionofculprit'sfaceifheor/shemadesomefaci
alchanges.

VirtualVoiceAssistant-
Theworldmovesinthepathofautomation.Peoplewanttheirliveseasyandcomfortablelikethishandfreeservi
ceprovidedbyvoiceassistants.Therearelotsofvirtualassistantsavailablelikegoogleassistant,Apple'sSiri,Cort
anabyMicrosoft,AlexabyAmazon,Samsung'sSvoice,etc.Astheremoreadvancesinmachinelearningvoiceassis
tantsbecome

moreemotionallyattachedtohumanbeings.Voiceassistantsremindusontimesothatwedonotskipsomeimpor
tantstuff.Voiceassistantsalongwithcomputervisioncandomanythingsthatweevencan'texpect.Itcandoalm
ost70%ofourdailywork,frommorningteatoevening

supper.

Evernote-
Evernoteusesmachinelearningwhichautomaticallyidentifiesthedocumentfilefromdevicestorageandappli
esfilteronit,suchthatitappearsclearandtidy.

5.SurveyonMachineLearningAlgorithm's

(RekhaNagar,Dr.YudhvirSingh–2022)

Thesubfieldofartificialintelligence,machinelearninghasgainedmuchpopularityinlastfewcoupleofyears. Manytechgiantsusemachinelearningalgorithms,likeNetflix'salgorithmstomakemoviepredictionfromy ourpreviouswatchedmovies.Inthissection,wewouldliketopresentsomeofthefamousalgorithmswhichus efrequently.

Theyare:

.**Naïve-Bayes'algorithm-**

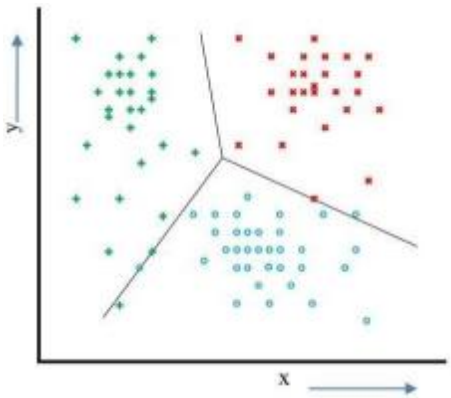
Thisisthealgorithmmostlyusedinmachinesandhardware.ItsimplyappliesBayes'theoremalongwith strongindependenceassumptions.Let'stakeanexample,tomarkanemailasspam,usedforfacedetecti onsoftware,etc.

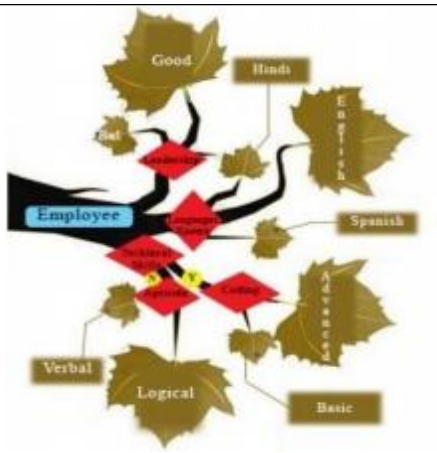
.**K-meansclusteringalgorithm-**Thisisatypeofunsupervisedlearningwhichhas

varioususesincludingbusinessandmanagement.Thisalgorithmalsoletsusknowprofitateachstageoft heproduct.ItisalsoreferredasLloyd'salgorithm.Thisalgorithmisalsousedingroupingoffeaturesintod ifferentlabels.

DecisionTrees-

Thesearetreesinwhichdecisionsaremadebythecomputerateachstagebaseduponrecurrencerelati ons.





.**NeuralNetwork-**

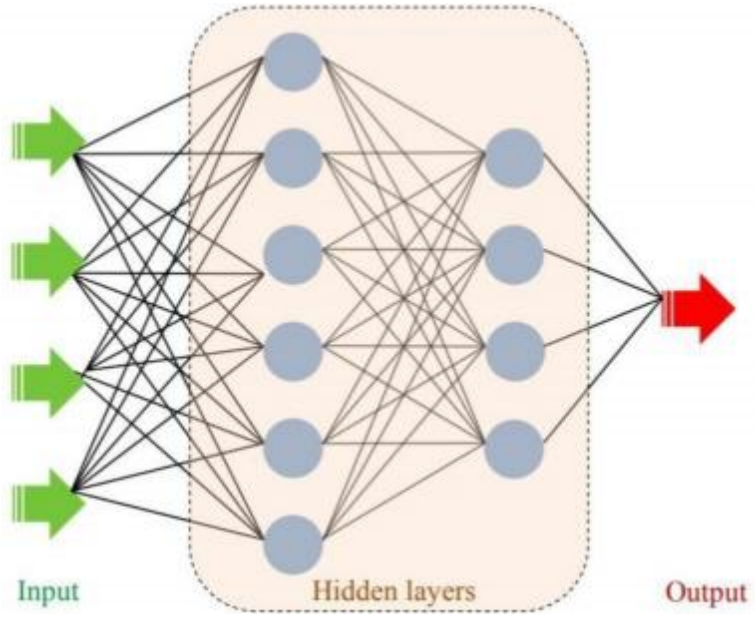
Ourneuronsinbodyplayamajorroleindeterminingthestepstoprocessasingletask.Similarly,artificialneuronsarethosewhichhelpthenervous

systemoftransistorsinanysequentialorcombinationalcircuittotakeupadecisionandexecuteitcon
ditionally.Thisagaindependsonactivityoftheneurons.Anartificial

neuronisanactualpieceofhardwaremachinerywhichhelpsthesystemtotakeupa

decisionbasedonthereceptors,assuchseveraloptoelectronicdeviceshavealreadybeen

developed.Thisalgorithmhelpsustobuildanymachinefunctioningexactlyashumanreflexarcs.



Algorithmsusedinmachineshaveseveralimportantimplementations.Wealsohave

regressionofvalueaswellasregressiontrees,whichhelpustododifferentusefulkindofjob.Thealgori
thmsarealsousefulinhealthcareindustries,forexample,random

forestdistributionalgorithm,thisalgorithmismostlyderivedfromstatisticalstudies…theyareus
efulincalculatingpeopledensitiesandmassorchunkdensity.Themost

importantistheartificialneuralnetworksalgorithm.Thisalgorithmisrelatedtoartificialintelligenc
eandneuralnetworking.Thoughformassapplicationwemusthavemachine

learning.Throughcomputervisionthesealgorithmjudgesystemsonbasisoftheirreactancet
oexternalstimuli.

6.SurveyonapplicationofArtificialIntelligenceinCyberSecurity(ShidawaBabaAtiku,

AchiUnimkeAaron,FatimaShittu–2020)

Cybersecurityreferstoprotectingyourpersonalcomputerfrommalicioussoftware.Machine

learninghasalotmanyalgorithmsandsystemswhichprotectusersfromthreats.SuchasthePaypalappwhichwasdevelopedinDecember1998,usesmachinelearningalgorithmstoprotectitsusersfromdifferentthreatsandonlinespoofing.Itusesthreetypesofmachinelearningalgorithmsthat

arelinear,neuralnetwork,anddeeplearningalgorithm.

Theyare:

.**Waterhole-**Itislikeapitsurroundedbygreenery.Hackersaccessotherpeople's

informationbyusingsiteswhicharemoreaccessibletothepublicmorethananythingelse....forexample,networksinacoffeeshopisaccessedbysomanyuserssuchthattheseusersloadtheirpc'swithwhatsoeverdataisprovidedtothem.Likethisthereaesomanysitestoputonvirusesandworms.Machinelearninghasalgorithmsthatdetectpathofthesemalwareblockingthemwithafirewallthereafter.

.**Webshell-**

Thesearepieceofcodewhichisloadedintoaworkingdevicewhichprovokestheusertomisjudgeandthentakingadvantage,entryisgainedintothefulldatabase.

.**Ransomware-**

Similartowebshell,butheretheuserisvulnerablythreatenedexternallybyagroupofsoftwarebrokerswhohavecorruptedtheusers'personalfiles.Such

scenarioscanbetotallyavoidedbyusingmachinelevellanguagewhichwasearlydetection.