SIH1604:Conversational Image Recognition Chatbot

Background: Ever since the birth of AI and computer vision, modeling conversations remains one of the field’s challenges, especially to combine both natural language processing and image recognition. Chatbots are now widely used as part of platform as applications like Apple’s Siri, Google’s Google Assistant or Microsoft’s Cortana. Detailed Description: Generally, a conversational Chatbot is an application that is able to communicate with humans using natural language. However there exists a need for an image recognition deep learning based Chatbot is an application to recognize the images, uploaded by user and answer the questions about the image. The main problem domain of this project is building a image recognization Chatbot, which is capable of recognize the object in an image and generating the best response for any the user’s query about the image. Expected Solution: Image recognition Chatbot is expected to detect the object in the image and have the related dialog of the image after training, also have understanding of the sender’s messages so that it can predict which sort of response will be relevant and it must be correct lexically and grammatically while generating the reply.

Reason: Apart from industries and education, this should basically help for physically challenged like deaf and dumb to have basic idea about this world.

Soln: First namma img ah crct ah pixels by pixels identify pannanum. There should not be any incorrect prediction. YOLO can be used for this and we need a refined dataset for images which can be integrated. Small scale la pannanum nah, for eg, like identifying dogs , we need a collection of pictures of dogs. For large scales we have to move to open sources . Kandippa deep learning techniques tha theva padum. For chat application, we have to work with NLP. And namma kudukkura soln , expected soln ah irukanum in user’s view. Like namma ipo oru lap oda img upload panna just similar pic kudukkama antha lap oda specifications including merits and demerits intha maari user friendly yah irukanum. For information retrieval, first antha img ah recognise pannitu aprm text datasest use pannikalam. Aprm important aah image given by user should be properly stored with security, privacy issues irukka kudathu. We should ensure this.

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SIH1606:Micro-Doppler based Target Classification

Description: The world today has bought on a need to pay increased attention to safety and security issues, for example, search and rescue operations, surveillance, and protection of critical infrastructure. These tasks are often labour intensive and potentially dangerous. This provides an incentive to create systems that aid operators to gain situational awareness. In this regard, unmanned aerial vehicles, pose a significant threat to privacy and security. To understand and assess this threat, classification between different drone models and types is required. One way in which this has been demonstrated experimentally is through this use of micro-Doppler information from radars. Normally birds and drones are often confused and there is need for a method which clarifies their corresponding class. Background: Due to substantial increase in the number of affordable drones in the consumer market and their regrettable misuse, there is a need for efficient technology to detect drones in airspace. Drone and birds both include micro Doppler signatures due to their propeller blade rotation and wing beats respectively. These distinctive features can then be used to differentiate a drone from a bird, along with studying them separately. Detailed Description: Classification of drones and non-drones using micro-Doppler signatures captured from Radar as a sensor. Moving parts of an object produce modulated Doppler components called micro-Doppler. The modulated Doppler signature is presented as added components to the Doppler signature of the drone body. Due to rotating blades, frequency modulated components, which are quite revealing, are produced. To observe the time varying micro-Doppler’s, received FMCW should be processed by Joint time-frequency analysis. A Conventional air surveillance radar system(operating usually at L-Band or S-Band) can rely on the radar cross section(RCS) of an aircraft for detection, but this may not always provide reliable detection, but this may not always provide reliable detection in case of drones.

Reason: This project deals with RADAR system where sometimes it fails to correctly identify differentiation among flying objects. Inorder to prevent birds, ithu theva padalam. Main ah military purposes ku use aagum.

Soln: First oru specific range kulla vara flying objects ah RADAR vachu track pannanum. Athula living (birds) vs non living (drones) ah image recognition moolama classify pannanu. Birds nah it should include all its kinds. Atha thavira illegaly drones ethu signal kulla irunchunah oru security alert kudukanum. Problem deals with day and night. Bcoz night tym la enough light irukathu. So img recognition becomes tough. So namma real tym la geographical location ah track panna mattum tha namma guess crct ah work aagum. Aanah intha project, datasets ithella thaandi oru real tym combination la work pannanum. And ithu konjam difficult ah irukalam bcoz namma RADAR signals iruntha tha objects ah detect eh panna mudiyum. Aprm epdi gmaps la namma locations ah paakurom oh atha maari any API vachu current ah antha location la enna lam iruku, not olny in ground, namma target flying objects , so athuku ettha maari detect pannum. I feel ithu konjam difficult.

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SIH1609:Implementation of the Alumni Association platform for the University/Institute.

Background: Alumni associations play a pivotal role in fostering lifelong connections between graduates and their alma mater, facilitating networking, mentorship, and philanthropic support. However, many alumni associations face challenges in maintaining engagement, facilitating donations, and providing valuable services such as job networking and tracking alumni success stories. A comprehensive Alumni Association platform for a University/Institute, encompassing both web and mobile applications, aims to address these challenges effectively. Detailed Description: The proposed Alumni Association platform for the Government Engineering College will feature robust functionalities accessible through both web and mobile applications: Alumni Registration: User-friendly registration processes on both web and mobile platforms, allowing alumni to join the association, update their profiles, and stay connected with peers and the institution. Donation Portal: Secure mechanisms on both platforms for alumni to contribute donations easily and support various initiatives and projects undertaken by the college, fostering a culture of philanthropy. Networking Hub: Dedicated sections on both platforms to connect alumni based on shared interests, professions, and geographic locations, facilitating professional networking, mentorship, and collaboration opportunities. Job Portal: Integrated job search and posting features accessible via web and mobile apps, enabling alumni to explore career opportunities, post job openings, and connect with potential employers within the alumni network. Alumni Directory: Search functionalities available on both platforms to find alumni based on different criteria such as graduation year, field of study, industry, location, etc., promoting networking and community building. Success Story Tracking: Features on both web and mobile apps to showcase and track alumni achievements, success stories, and notable contributions to society, inspiring current students and fostering pride among alumni. Events and Reunions: Announcements, registrations, and management.

Reason: Kandippa ella students will not feel free to have contact with seniors, so atha overcome panni oru user friendly platform maari develop panalam. Unlike Linkedin, itha oru career development portal with alumini consulatation ah vum kondu varalam.

Soln: First logins ellame within the network ah irukanum (peoples of same college). Oru senior oda connection la irumtha mattum tha benefits ngra maari iruka kudathu. Naa avangloda connect eh panla naalum avanga posts enaku reach aagi atha vachu naa avangla inspire panra maari irukanum. Any consulation help venum nah atha daily task maari vachu notifications oda senior advice junior ku reach aaganum, similar to mobile apps. Aprm trustees, charity and donation support kuda provide panlam but should be confidential. Job offers, start up ideas, avanga padicha clg ku oru development project ithellam provide panra maari irukanum. Resume, datas la store panna MongoDB, MySQL and daily notifications ku Django channels, aprm confidential payments ku Razorpay intha maari platforms use pannikalam. Ithula main eh UI tha. Evlo attractive and user friendly aah iruko antha alavuku oru nalla mobile app maari design panlam.

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SIH1628: Smart Competency Diagnostic and Candidate Profile Score Calculator

Project Concept: Comprehensive Employment Platform/Portal The current employment portal lacks a personalized and adaptive approach to job matching and skill development. There is a need for an intelligent system that not only matches job seekers with potential employers but also identifies and suggests training courses to bridge skill gaps. We wish to design a competency diagnostic which would ask a series of questions to students to test their competence and based on their scores in the test, recommend jobs to them and also appropriate training courses to them to cover the gaps in their skill curve. Requirements: 1. AI Powered Job/Training Recommendation System: • Implement an AI-based recommendation system trained on multiple data points (e.g., skills, experience, preferences) to analyze job seekers' profiles and recommend suitable job opportunities. • Training Course Recommendations: Suggest relevant online courses, workshops, and training programs based on the desired job roles. 2. Skill Gap Analysis and Recommendations: • Gap Identification: The recommendation System should assess job seekers' competencies against the requirements of their desired job roles to identify areas for improvement. • Personalized Suggestions: Provide tailored recommendations for online courses, workshops, and training programs to help job seekers upskill and close identified gaps. 3. Adaptive Learning Pathways: • Personalized Learning: Develop adaptive learning pathways based on the job seeker's progress and feedback. • Content Variety: Offer a mix of micro courses, webinars, and hands-on projects relevant to the job market to enhance learning and skill development. 4. Real-Time Job Market Insights based on candidate’s skills and competencies: • Dashboard: Create a dashboard displaying real-time data on trending jobs, skills in demand, and salary benchmarks. • Data Analytics: Use data analytics to provide insights into job market trends and forecast future skill requirements. 5. Skills Verification and Certification: • Skill Assessments: Implement a system for verifying skills and certifying competencies through assessments and tests. • Badges and Certifications: Offer badges and certifications.

Reason: This plays a role in seeking jobs for an individual where he feels inferior in his abilities and still lacks confidence. So namma kudukura soln should enhance his efficiency and also should suggest some other platforms to develop skills.

Soln: Oru person oda biodata collect panra maari avangloda technical strength and weakness therinjikanum. Resume ah input ah vangurathu kuda better ah irukum. And oru chatbot maari ceate pannom nah even avangloda communication skills along with technical knowledge ah oralavukku guess panalm. Oru vela freshers aah irunthu avangloda skills enna nu avangle therinjikama iruntha nammale some test conduct panni talent ah score pannikalam. Test nah programming languages/ full stack/ Language models/ project development intha maari activites kuduthu scoring pannikalam. Ithula enna domain avanga strong ah irukanglo atha improve panna websites, suggetions kudukalam. Itha use and throw app maari ilama daily use updates ku kondu varanum nah puthusa emerging technologies ah pathi educate panlam. Whoever finds difficult to rate his skills or need a guidance to choose a career , itha use panra maari irukanum. Kandippa career suggestion ku standard datasets theva padum. And itu oru interactive and motivating app ah iruntha , it feels better. Simple ah solanum nah Irugapattru nu oru movie la oru relationship ah enhance panna calculations and innum strong aakah daily tasks nu notifications kudukura maari app irukum. Similar to that, intha chatbot avanga technical weighatage ah pathi pesanum.

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SIH1683: Development of AI/ML based solution for detection of face-swap based deep fake videos

Background: Synthetically-generated audios and videos i.e. deep fakes are in trends nowadays. Although these have caught imagination of computer and tech savvy generation, at the same time, these have created concerns because of their ability to disrupt nation’s politics, committing frauds, create dis-information and creating non-consensual contents. Use of Deep fake has also been seen recently to purposefully defame the character of a person in specific. Due to enhancements in AI/ML and Large Language Models for Generative AI, identification and detection of deep fakes have created a huge challenge for Security Agencies. Research on multiple aspects of deep fake identification has been started. As a use case for the problem statement, a forensic technique to authenticate face-swap deep fake videos in which a person's facial identity is replaced with another's may be developed. Detailed description: Addressing the deep fake problem requires a multi-pronged approach, combining technology, regulation, education, and collaboration to mitigate the risks and protect individuals and society. However, on the technological front Detecting deep fakes involves development and testing with numerous advanced algorithms and tools. Here are some of the prominent approaches and technologies that can be used in deep fake detection: i.Convolutional Neural Networks (CNNs): CNNs can be trained to detect inconsistencies in facial features, expressions, and movements. CNNs can also analyse video frames over time to identify unnatural transitions and discrepancies. ii.Recurrent Neural Networks (RNNs) and Long Short-Term Memory (LSTM) Networks: RNNs and LSTMs can be used to analyse the sequence of frames in a video to detect temporal anomalies and inconsistencies indicative of deep fakes. iii.Capsule Networks: Capsule networks can identify discrepancies in facial pose and texture. iv.Adversarial Training: Adversarial training involves using Generative Adversarial Networks (GANs) to generate deep fakes and simultaneously training another model to detect them improving the robustness of detection algorithms.

Reason: Nowadays ellarum social media la romba active ah irukom. Posting pictures, making reels intha maari namla nammale showcase panrom. So namma id’s la irukura post ah yaaralm rule over panranga, save or download with anyother websites la parangla nu therinjikalam.

Soln: https://github.com/ondyari/FaceForensics, <https://www.kaggle.com/c/deepfake-detection-challenge/data>, intha maari some fake faces detect panna niriya datasets iruku. Itha thaandi nueral networks helps in fraud detection of images. Ithella vachu fake vedios ethum release aachunah atha kandu pidikalam. Aanah athu mattu pathathu. Namma img steal aagum pothe namaku warning messages varanum. Itha mudinja alavuku oru compulsory security permissions settings la permit panlam. And social media la private/ public entha acc ah irunthalum avanga img ah screenshot edukuratha track pannanum. Ithu oru cyber security related project ah irukanum. Like Kaavalan app epdi namaku physical threats nadakurapo emergencies ku help pannutho, ithu before threat namma own datas engayum acces panna try panna without our knowledge ethu nadakatha maari paathukanum.

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SIH1775: Fake social media accounts and their detection

Background: At present the ITBP guards 3,488 km long India-China borders ranging from the Karakoram Pass in Ladakh to Jachep La in Arunachal Pradesh. Apart from this, the Force also has important roles in many internal security duties and operations against the left wing extremism in the state of Chhattisgarh. Creating fake accounts on Facebook, Instagram or at any other platform and fake account uses, should be identify for account suspension or legal action. To safeguard the organization from the unknown fake account messages over any social sites, a tool may be developed for their identification. Also a central agency should be designated to get the information about the identified fake account holder informed by the developed tools and accordingly, concerned social site organization will approach to delete/suspend the fake account in time bound manner worldwide. Description: How to discover/identify fake profiles on Facebook, Instagram, twitter or other social apps using tools. Also subsequently how to ignored/reported/make to delete of these identified fake accounts by the tools/ through concerned agency in India. Expected solution: 1. Tools for identifications of fake account should be developed for popular social sites. 2. A Central Agency should be designated to get the information about the identified fake account holder info by the developed tools and accordingly, concerned social site organization will approach to delete/suspend the fake accounts in time bound manner worldwide.

Reason: Ithuku oru nalla reason eh namma class ASSO la share panna Feb 26 case study tha. So to prevent ourselves, we have to make use of this.

Soln: Ithu similar to above prblm tha, deals with social media. But datas nu illama completely acc ah secure panra maari.

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So, overall ah entha software project choode pannalum, we need deep learning models, NLP and docker for deployment and DB’s for storage. To integrate it as mob app, we can make use of flutter.