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A CRITICAL DISCUSSION OF NLP AND COMPUTER VISION SYSTEMS IN SOCIETY

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INTRODUCTION

The subject of artificial intelligence (AI) known as Natural Language Processing (NLP) aims to make human language understandable to robots. Using deep learning and NLP algorithms, NLP combines the capabilities of linguistics with computer science to analyse language norms and structure and construct intelligent systems that can extract meaning from both text and voice. Syntax, semantics, pragmatics, or morphology are just a few of the components that NLP looks at while attempting to decipher the context and organization of human language. Machine learning algorithms that could handle particular issues and accomplish certain tasks are then created by computer science using this language information" (Caldwell and Tanay, 2020). As an example, look at Gmail. Emails are automatically labelled as Marketing, Social, Primary, as well as Spam because of an NLP operation called keyword extraction. In order to allocate emails to the correct category, computers scan the subject lines and associate them with specified tags. This allows them to learn automatically. However, computer vision is a branch of artificial intelligence (AI) which allows computers and systems to extract meaningful information from data photos, videos, and other visual inputs and conduct actions or make suggestions based on that information. It is only with computer vision and artificial intelligence (AI) that robots can really "see." Machines are trained in these capabilities by using cameras, information and algorithms instead of retinas, nervous system and a visual brain. Using a machine trained to examine items or monitor a manufacturing asset may swiftly outperform human skills, spotting even the tiniest faults or concerns (Chen and Zhang, 2021).

DISCUSSION

Computer vision with natural language processing have both benefited greatly from recent advances in deep learning as well as the availability of massive datasets (NLP). Using deep convolutional neural networks (CNNs), computer vision applications like picture categorization and object recognition have been improved to new levels, e.g., Classic NLP tasks such as named entity identification, sentiment analysis and question-answering have also seen significant progress thanks to a variety of deep learning methodologies. There has been a drive to study concepts and reasoning skills at the junction of visual and language (V&L) understanding, building on recent advancements (Caldwell and Tanay, 2020). V&L systems may be used for a wide range of purposes, from assisting the blind to enhancing human-computer interface and visual search. It

would be much easier for robots to work with humans if they could comprehend and use human language (Chen and Zhang, 2021). Researchers working on V&L challenges, however, see them as stepping - stone toward the visual Turing test, which serves as an important benchmark for advancement in AI (AI). With the visual Turing machine, it is necessary to show that a V&L algorithm is capable of visualising linguistic ideas in terms of objects, qualities, and relationships (Esteva and Ramsundar, 2019).

The ability to measure natural language comprehension as well as goal-directed visual comprehension is made possible by the integration of vision and language. Many different computer vision and natural language processing (NLP) talents may be required for V&L activities at the same time. Such tasks as separation between the two, entailment and cross resolution and visual and verbal reasoning may all be performed concurrently by the same system (Gopalakrishnan and Agrawal, 2017). For instance. A thorough Turing test would include more than just a few V&L benchmarks, but one believe that a thorough review should evaluate each capacity necessary for visual and textual comprehension separately, in order to determine if an algorithm is correct for the proper reasons. There must be some kind of visual and/or verbal inputs or correlations that can't be ignored in order for a benchmark to be considered excellen (Grewe, 2019).

SOCIAL ETHICAL ARGUMENT

As a result, data scientists have generally been less involved in ethical arguments over their subject matter, but this seems to be altering, The public outrage over the “emotional contagion” research on Facebook further demonstrates that data sciences increasingly influence human beings in real time, and that one may have to reevaluate the application of ethical issues to one study (Gundimeda and Babu, 2019). Ethical difficulties in NLP research should be discussed since one area uses comparable data sets and works with their content. However, privacy issues have dominated most of the ethical debate in data science to far. It's important to acknowledge these issues since they touch on issues like digital rights management/access restriction, policy formulation, and security that aren't just relevant to NLP but should be addressed by the whole data sciences community (Hovy, 2016).

Steps have already been made in this direction. Instead, one want to look at the broader societal effect that NLP may have by moving beyond anonymity in ethical analysis (Hovy, 2016). In particular, researchers wish to examine the influence of NLP on social justice, i.e., equitable chances for individuals and groups like diversity within society can access resources, have their opinion heard, and be recognized in society Contributions from everyone of us The public debate of IT and data ethics is frequently laden with dread of the dark and unreasonable expectations, hence one think ethical talks should be driven by practitioners (Marco, 2018).

For example, in the public dialogue regarding AI individuals either ignore the whole approach, or overstate the possible hazards for a practioner's view point. To reclaim the initiative for NLP, one've written this paper (Caldwell and Tanay, 2020). In addition, one feel that the area of ethics may provide a broader framework, hence this article is a partnership between NLP & ethics experts (Esteva and Ramsundar, 2019). To aid the conversation, one also present some of the relevant terms from the literature on morals of technology, particularly the ideas of exclusion, exaggeration, bias confirmation, subject under- and expose, and dual usage (Chen and Zhang, 2021).

CHALLENGES

Natural language processing poses a number of difficulties for academics and researchers, most of which have to do with the always expanding and changing nature of the natural language process itself. People have typically had to use a programming language or a particular language to speak with computers (Gopalakrishnan and Agrawal, 2017). These programming languages are highly organised, precise, and free of ambiguity. Human speech, on the other hand, isn't always an exact means of communication; it's usually rife with errors. Slang, regional dialects, and the social environment in which a language is spoken all have a role in the linguistic structure. In natural language processing, as previously said, the goal is perfectio (Grewe, 2019). Semantic analysis, for example, remains a significant difficulty. In addition, it is difficult for such systems to effectively interpret language that is used in an abstract manner. When it comes to the interpretation of humour, natural language processing isn't very good (Gundimeda and Babu, 2019).

The speaker's emphasis on a syllable or word may also alter the meaning of a sentence's structure. Tonal shifts in a speaker's voice may be missed by speech recognition algorithms, which are based

on natural language processing. An algorithm's parsing accuracy will be further hampered by the wide range of accents represented by speakers' tones and inflec(Hovy, 2016). The fact that human languages - and the ways in which they are spoken in various communities - are always evolving presents a challenge to natural language processing. While it is true that a set of laws governs how a language is written and spoken, these rules are always changing. As the characteristics of real-world languages evolve, rigid computational directives and rules may become outmoded (Marco, 2018).

Many instances of computer vision have been used in practise because it is possible to build a computer vision system that can "see" and "comprehend" its surroundings (Hovy, 2016). They employ CV systems to receive information about their environment and then use it to make decisions about what they should do next and how. For example, a manufacturing robotic machine employing CV, which is programmed to fulfil its planned activities, 'views' and comprehends its surroundings. By merely 'looking' at assembly components as they go down the production line, such devices may detect flaws and tolerance limitations. In order to find particular items in digital photographs, search through product image libraries, and extract data from photos, applications employ CV data vision theory. Facial recognition technology (which has embraced CV) is used by businesses and government organisations to "see" exactly what a person is attempting to obtain access to (Marco, 2018).

ETHICS DISCUSSION

So far, the design of NLP studies has not eliminated the necessity for ethical concerns, and hence, notwithstanding individual comments, there is minimal debate in the community about this issue. There are only three hits for "ethic*" in the ACL anthology when searching for the term (Okinda, 2020). Couillault et al. (2014) is the sole work that focuses on the legal and quality aspects of data sets, leaving only a panel discussion and a book review. (Plötz, 2018) Some NLP curricula2 have addressed social issues, but there hasn't been a debate at the academic level until now. The most plausible explanation is that there have been no human subjects engaged in NLP research to yet (Reddy, 2019). 3 The majority of NLP applications in the past concentrated on augmenting existing text that was not firmly related to any individual author (newswire), was typically released openly, and frequently had some temporal space between it and its publication date (novels (Stone and Etzioni, 2016). For all of these reasons, the study could not have an impact on the authors'

lives in a direct way. In recent years, the usage of social media data, where the writers are contemporary persons, has led to a shift in this position. "traceability" refers to whether people can be recognised, which is undesirable as experiment participants, but may be valuable for annotators (Wiriyathammabhum and Aloimonos, 2016).

Couillault et al. (2014) discuss these difficulties under the term "traceability." The first crucial thing to remember is that language, the focus of NLP, is a good indicator of a person's character and conduct. Conscious and subconscious qualities are both used to identify members of various groups, and this signal may be intentionally used to project a certain image. When a person speaks, they do so at a certain place and time and by an individual who has all of the criteria listed abov (Stone and Etzioni, 2016). If one take these aspects into account, then the utterances one use in NLP may convey latent information about the individual and the context, although to different degrees. This information may be used to infer author traits from text, which in turn can be identified by and impact the performance of the proposed algorithm (Okinda, 2020). The ethical concerns of NLP research are becoming more relevant as more and more linguistic technologies become accessible (Plötz, 2018). These technologies are influenced directly by the quality of the study that is conducted. The following is an attempt to arouse interest in the potential ethical dilemmas that might arise during and as a result of NLP studies (Reddy, 2019).

SOCIAL IMPACT

There's no denying that technological advancements and innovations have had a profound effect on society. Artificial Intelligence (AI) is making its way into the healthcare industry as well, assisting doctors in diagnosing, finding the source of diseases and recommending various treatment options as well as performing surgery and predicting if the illness is life-threatening, according to an article referenced above. These are all boxes that most practitioners would want to check. (Marco, 2018) Today's medical treatment is hectic, demanding, stressful, and frequently overwhelming, and that's just the way it is. Practitioners are always under pressure to provide great care while balancing enormous workloads. They're worn out and depleted. Artificial intelligence (AI) solutions have been created to eliminate fatigue-related mistakes. Unlike humans, artificial intelligence (AI) never goes to sleep. Analyzing and questioning the visuals and data is never-ending for it (Wiriyathammabhum and Aloimonos, 2016). An additional safety net to support their workload and day-to-day life may be provided by a pair of never-shut-up eyes for the medical

profession. One become better at a variety of things, but one of my favourite applications is stroke detectio(Reddy, 2019). When it comes to patient outcomes, the capacity of algorithms to expedite treatment or identify areas of potential danger may make all the difference. A patient may get life-saving therapy before a stroke has taken full effect, or at a pace that mitigates the entire effects of it, and so enjoy a fundamentally altered quality of life, thanks to the social impact of artificial intelligence in healthcare (Plötz, 2018). When it comes to supporting radiologists, solutions such as Aidoc have been around long enough to establish their worth. Because of their demonstrated added value, AI technologies for streamlining processes, continuously monitoring skyrocketing imaging volumes, and alerting practitioners to possible patient concerns are gaining traction throughout the world (Marco, 2018).

POSITIVE CONSEQUENCES AND IMPACT

One used the term "deep learning" to describe AI for the purposes of this study. A taxonomy used by social-sector organisations like the AI for Good Foundation and the World Bank helped us categorise use cases into eleven social impact areas. In each use case, an AI feature may be used to address a significant issue. To put it simply, it is difficult to measure or compare the worth of easing human suffering. However, by using the frequency of use as a proxy, one may estimate the potential effect of various AI capabilities (Hovy, 2016).

One were able to locate a genuine AI deployment for one-third of the use cases in one database. Due to the fact that many of these solutions are only test cases to see whether they work, they typically indicate that there is more room for growth. It is safe to say that most, if not all, of one use cases might benefit from the addition of artificial intelligence (AI) approaches to the solutions that have already been implemented for three-quarters of one situations. (Gundimeda and Babu, 2019) One collection is not complete, and it will continue to grow as AI improves. Specific crisis-related problems include disaster response and disease outbreaks in search and rescue efforts and other catastrophe-related situations. With the use of AI, satellite data may help firefighters better plan their reaction in the event of wildfires (Grewe, 2019). Drones with AI capabilities may also be used to detect missing individuals in remote locations. With a concentration on presently disadvantaged groups, these categories entail increasing access to economic resources and opportunities, including employment, the development of skills, and market knowledge (Gopalakrishnan and Agrawal, 2017). Using low-altitude sensors, such as cellphones and drones,

AI may be used to boost yields on small farms by detecting plant damage early on. Sustaining biodiversity and battling the loss of natural resources, pollution, and climate change are difficulties in this sector. AI technologies like Google's TensorFlow are used by the Rainforest Connection, a charity based in the Bay Area, to help save rainforests throughout the globe. The platform's audio-sensor data may be used to identify illicit logging in forest reserves. (Gopalakrishnan and Agrawal, 2017)

CONCLUSION

Hence, Providing, validating, and recommending useful, important, and credible information to the public is a major difficulty in this field. Filtering or combating inaccurate and divisive information sent via the relatively new channels of the internet and social media is at the heart of this initiative. In India and Mexico, the spread of fake news through messaging apps may have disastrous effects, including the manipulation of election outcomes and even mob violence. Examples in this field include offering contrasting viewpoints to isolated social media groups. Crime prevention, monitoring offenders, and reducing prejudice in police forces are all part of this field's responsibilities. Rather than as a component of public-sector management, it places an emphasis on security, police, and criminal justice concerns. In order to aid firemen navigate through burning buildings, AI and data from IoT devices may be used as an example.

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