Midterm report

A description of the group and member backgrounds:

This group has only one member Shuvo Mahmuda, a fourth year student master student in informatikk: programming and network. Background from earlier; a bachelor degree in mathematics and computer engineering from university in Agder (UiO).

A description of what area of "interaction with AI" the group is interested in working with

Area of "interaction with AI" the group is interested in working with is in AI behaviour and understanding correlation between functional behaviour of an AI and its implementations. That is how to implement machine learning framework in a AI system that interacts with the users, which could be a Chatbot or an automated framework system assisting human.

Understand how a dynamic interaction/dialog flow between a human user and AI could be efficient and robust based functional criteria on both end, such as how an AI and human user would communicate/collaborate in a formal setting. Investigate how user and AI in certain cases, such as in the case of a Chatbot will interact with a user and what type of issues that generates from these interactions. Specially a Chatbot can tackle a formal conversation and system capabilities (Saleema Amershi 2019).

Background

(Daugherty 2018) is a Harvard review journal about collaboration between humans and AI, and where AI will radically alter how works gets done and how works will be assigned. In this review, authors focus on future impact of AI will revolve largely around complementing and augmenting human capabilities, and not obsoleting human.

What comes naturally to people (making a joke, for example) can be tricky for machines, and what's straightforward for machines (analysing gigabytes of data) remains virtually impossible for humans, and a business requires both kinds of capabilities to function properly. In this review author referees to how a machine learning framework requires humans assisting machines and breaks it down to three crucial roles, such as **training**, **explain** and **sustaining**.

Training the machine to perform certain tasks, Machine-learning algorithms must be taught how to perform the work they're designed to do. In that effort, huge training data sets are amassed to teach machine-translation apps to handle idiomatic expressions, medical apps to detect disease, and recommendation engines to support financial decision making. An AI system must be trained as such that its best suited to assisting and interacting with humans. Take Microsoft's AI assistant Cortana as an example, Cortana requires extensive training to develop just the right personality: confident, caring, and helpful but not bossy. To extract those qualities took countless hours of attention by a team that included a poet, a novelist, and a playwright.

Explaining outcomes from an AI based system is a crucial and integral part of AI-Human collaboration environment. This gives insight into decisions made by AI to a non-expert user. These "explainers" are particularly important in evidence-based industries, such as law and medicine, where a practitioner needs to understand how an AI weighed inputs into, say, a sentencing or medical recommendation. Similarly, insurers and law enforcement understand why an autonomous car took actions that led to an accident—or failed to avoid one.

Sustaining, the developers of industrial robots that work alongside people have paid careful attention to ensuring that they recognize humans nearby and don't endanger them. These experts may also review analysis from explainers when AIs do cause harm, as when a self-driving car is involved in a fatal accident.

(Rafal Kocielnik u.d.) refers in the article how AI system expectation and capabilities varies between users and users' prior expectation on the AI. Further, analyses on methods for setting appropriate expectation before initial use of an AI-based system. Such study also has been done in (Saleema Amershi 2019) where case studies base on how users and AI interact and users' satisfactory outcomes shown as users self-understanding and expertise in technologies. In this article, authors give an account of a Scheduler assistant bot organizes automated meeting requests from free-text email and calendar-scheduler.

Further, explores techniques for shaping end-user expectations of AI-powered technologies prior to use and study how that shaping impacts user acceptance of those technologies. Article proposes three different techniques to shape user expectation: external information, understanding and first-hand experience through a sense of control. These techniques impact on AIs imperfections: generating results as False Positives and False negatives. Furthermore, shows that False Positive errors are more accepted by participants in AI system due to lower cost of recovery from this type of error than False negative results for obvious reasons.

Questions

Questions that I want to investigate in this projects are followings:

How to tackle ambiguity in AI and Human interactions, what is the processes and the techniques should presuppose to enhance an AI to reach this capability?

This comes along because after understand and reviewing some the relatable works, such as from (Fabio Ballati 2018) one gets the insight on different approach to AIs capabilities of tackling ambiguous requests from users, or to lead a formal voice conversation with an AI where a user has voice impairment that makes a conversation semi-processable. This is a typical scenario where machine that have been trained on data that do not cover/include users with voice disabilities or cognitively impair abilities. Or the precision of an AI to infer suggestions that are based on earlier inquiries, requests and knowledge on user-machine transaction and how an AI can decide what is a knowledge or not (Ewa Luger 2016).

Methods and Techniques:

I would like to do literature and theoretical background reviews on topics such as AI, machine learning, HCI and robotics. AI is a broader subject area with a lot of different aspects of it. Literatures and theoretical review is vital before tackling problems in AI related subject area. All the subject area mentioned above are sub-subject areas of Artificial intelligence.

In this project Investigating user experiences and interviews would beneficial toward reaching the projects goal since combining with theoretical background and real-live data would verify some of the assumptions.

Case Studies would be conducted as a part of the literature review and background.

Findings

Interviews / test cases

I have conduct mini interviews to gather knowledge on user usability in interaction with an AI. It is standard to set up a set of questionnaires for the users to complete throughout a test scenario where developer or system owner can exclude errors or logical complexity in a user based system. There verities of logical complexities and user's misunderstandings in usability of an AI UI.

The crucial findings that have been extracted between two interviews, that is difficulty level in covering a set of questions for users to complete. In a user-application where type of question sets are more easier to set up since functionality for the end-user are visible and user has fairly predictable responds. In testing AI that varies a lot between users, like user-responds between ages are obviously different, one of the interviewee was under 15 years and instruction-dialog between him and IPhone-SIRI completed much quickly and efficiently than the older interviewee, and satisfactory level were much higher than the older interviewee who was 35 years old. Interaction with SIRI and the younger interviewee seems more natural and formal. His way asking questions to SIRI seems more natural and human than the older interviewee. So the main finding from this interview round is the younger users are more productive in using AI and more advance in usability.

Appendix 1

Chatbot module 1

To create this chatbot I have identified what this chatbot should solve and the practical usage of the chatbot. In a busy day often people loss overview over their daily tasks and meetings during the work-hours and after work-hours: training/exercise or other activities, etc. Most practical use of a system would be scheduler that can schedule calendar and meetings where schedulerbot alert users according to calendar and help the user with suggestions for time-conflicting meeting and activities.

I have set up a set of questions and answers in the dialog-flow objects where Chatbot picks up keywords from a formal conversation and forwards suggested schedules according to calendar requests.

By creating schedulerbot, I have realised the need of covering different aspects in a conversation, where responds of a query generated independently by a chatbot and that cannot be solve on the spot. But needs to be done dynamically overtime, and how crucial it is for AI chatbot to have an embedded machine learning system that chatbot could self-learn from interaction based on its algorithm.

Appendix 2

Machine learning assignment, was quit within my understand since I am writing my master thesis in constructing and using of machine learning framework for ontology alignments. But I do not have any background on unsupervised learning side of the machine learning where word-vectoring is the part of the ML blackbox because in this case as I understood the chatbot learns on the fly in conversation. But it was educational as I progressed in building it.

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