

Cognitive Assistant Protocol Selection

Comparison of The Motivations Behind Facebook Users And TikTok Users

A Thesis Prospectus Submitted to the

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,

Technical Project Team Members

On my honor as a University Student, I have neither given nor received
unauthorized aid on this assignment as defined by the Honor Guidelines
for Thesis-Related Assignments

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Introduction

Emergency response situations require quick thinking and critical decision making. One wrong decision or a second of hesitation from an emergency responder can result in major consequences. My technical research will dive deep into a modular component of a cognitive assistant for emergency response which intends to improve situational awareness and safety of first responders by real-time collection and analysis of data from the incident scene and provide dynamic-driven feedback to them. My research will specifically be focusing on how to improve the performance of the behavioral-tree framework of the modular component by incorporating the knowledge of protocols into them and by testing the performance pipelines using streaming data.

Knowing the user motivation and psychology behind different social media platforms can play a huge role on how future social media algorithms will develop in the future. My STS research will focus specifically on comparing Facebook and TikTok in terms of each respective platform's users, purposes of spending on time, the friendships defined, the algorithm and user interfaces, and how the respective algorithm designs attract different users.

The technical subject of the STS prospectus and the technical topic for the Dept. of Computer Science is not related.

Technical Topic

The scenes of an emergency medical service is a scenario that requires immediate expert attention. Medical responders rush over and have to assess the situation, assist victims, and make appropriate split-second decisions based on the feedback and data the responders receive. Even just a few minutes of hesitation or errors can have a huge impact on whether a rescue is successful or not.

Collecting, gathering, filtering, and processing this type of data in fast, high-pressure situations require a lot of human cognitive effort which can lead to numerous mistakes if the responder isn't focused. There have been past research to address such concerns such as: wearable assistive agents for trauma documentation and management, stimulating dynamic interactions between different human agents and potential digital agents in a hospital emergency environment using state machine based models, and information visualization agents the present information gathered based on predicted intent and recent observations from the emergency scene. However, from what is known, no previous research focus on dynamically recommending situation-aware interventions for real-time emergency response decision support.

With the lack of previous research, cognitive assistants for emergency response are currently being developed that will improve situational awareness and safety of first responders by real-time collection and analysis of data from the incident scene and provide dynamic data-driven feedback to them.

The data will come from responder-worn devices and smart sensors to monitor activities and communications at the incident scene and aggregate this data with static data sources such as

emergency response protocol guidelines to generate insights that can assist first responders with affection decision making and taking safe responses.

Previous work has already been developed for this cognitive assistant with a Behavior Tree framework and accomplished an average top-3 validation accuracy of 92.5% and an average validation accuracy of 65%. Behavior Trees out of multiple different Machine Learning frameworks have found to work with the most success due to its modularity, high responsiveness, and the ability to learn and adapt using reinforcement learning.

To improve upon this source of work, my research will be based on how to improve the performance of the behavioral-tree framework by incorporating knowledge of protocols into them and by testing the performance of pipelines using streaming data.

I plan to have a time frame of a semester's worth of 15 weeks to conduct independent research with the help of my Technical Advisor, Professor Alemzadeh, during this period. The goal during this time frame is to improve the performance of the machine learning methods above an average top-3 validation accuracy of 92.5% by using streaming data to test the performance of the pipelines. At the end of the 15 weeks, I will deliver a technical report diving into depth about the approaches I conducted, my evaluations, and future steps.

STS Prospectus

Introduction

Given that Facebook is one of the most established Social Media platforms on the market for years now while TikTok is the most rapid growing Social Media platform, knowing on a deeper level the motivations behind Facebook users compared to the motivations of TikTok users will help equip for a better prediction on the direction social media algorithms will be moving toward in the future.

The answer to user motivations behind Facebook users and TikTok users will never be completely solved. Finding out the motivation on a deep psychological level will take a long time for evaluations and a given answer will never be absolutely right or wrong, just better or worse. Because there's no clear answer to this question, and there are multiple stakeholders with conflicting agendas such as users, content creators, brand sponsorships, advertisers, social media teams, and much more, finding why a social media user would favor one platform over demands an STS investigation.

Research Question

The comparison of user motivation for Facebook versus TikTok can be broken down into five questions for each respective platform. First, who are the users? Second, what is the purpose of spending time on the platform? What role does offline friendships play in the platform? How do the algorithm and user interface design differ? Finally, how do the different algorithm designs attract different users? Breaking down this STS investigation into those five questions will help make the results both broad and deep, while being understandable and

clear.

In terms of users, what age group does each platform mostly favor? Based on real experience and my current network, I hypothesize Facebook mostly targets college students as well as adults. College students just want to have a large social circle, and adults want to stay connected with people in their social circle they may forget about. With Facebook focusing more on paid reach, Facebook may have more advertisers and business owners trying to promote their products or services, while TikTok may have more influencers and content creators due to the TikTok algorithm favoring organic reach.

I predict based on my own personal experience as well my social network's experience that the motivations behind motivations of Facebook will be leaning toward connecting with friends and family, and catching up on news with a user's current social circle. TikTok, on the hand, doesn't require an offline social circle, so I believe the motivations behind Tiktok will be more focused on both creating and watching quality engaging content.

Now as for the role offline friendships play in each respective platform. I can guess that Facebook requires offline friends to be favored over TikTok. Most of the content seen is through the friends connected on Facebook. No friends will result in less content the Facebook user can consume. On the other, TikTok requires no previous offline relationships. Therefore, a user can simply download the app and can consume endless amounts of content immediately. Based on that information, I can hypothesize more sociable outgoing individuals will favor Facebook, while more introverted insecure users will lean toward TikTok.

As far as how each platform's algorithm is designed. Facebook shows mostly friend's

content. Content can take on the form of short questions, quick paragraphs, longer videos, Facebook lives, Facebook groups, and sponsored posts as well. TikTok focuses more on discovery and exploration, showing quick 10-15 second videos. TikTok shows a user's content in sample "waves", The more users engage with a piece of content from TikTok, the more the organic will exponential grow and be seen by more users.

Finally in terms of how the different algorithms attract different users, I hypothesize the Facebook algorithm will favor users who just want to stay in touch with friends and not feel left out by constantly seeing what's going in a social circle. I believe TikTok users will lean toward a younger generation that has less of an attention span, as well as less of a social circle to connect with online.

Literature Review

As stated prior, my research will address the differences in motivations of Facebook users compared to the motivations of TikTok users. Again, the research will be broken down into five questions. 1) Who are the users? 2) What is the purpose of spending time on the platform? 3) What role does offline friendships play in the platform? 4) How do the algorithm and user interface design differ? 5) How do the different algorithm designs attract different users? Breaking down the research question provides a good framework to make the results cover a wide range while at the same time having depth. While there is a lot of research on the motivations behind specifically college students on Facebook, there isn't a lot of known research on the motivations of other Facebook users or TikTok users in general. There also isn't a wide variety of known research on how both platform's algorithms specifically play roles in affecting user motivation.

Droguer (2011) targeted his research primarily on 17-37 year olds with a focus on 18 year olds. Many other studies on Facebook research have targeted specifically college students around 18-22 year olds as well. (Bumgarner, 2007; Lyndon, 2011; Pempek, 2008). Hernman (2019) primarily niched his research on the generation of 13-18 year old TikTok users. Many other TikTok user studies have targeted 13-18 year olds as well. (Omar and Dequan, 2020; Bresnick, 2020). The difference in the age group targeting between the two different platforms could've happened as college students to have a larger social circle being acquainted with friends from elementary school, middle school, high school, college, and extracurriculars. On the other hand, 13-18 year olds may not have a large enough social or a well-developed attention span which could explain why they would favor TikTok more. While this being said, the audience of both platforms are always changing based on updated circumstances so the Facebook targeting of 18-22 year olds may not be as good of choice as the market is always shifting.

Ross (2008) theorizes that the general motivation of Facebook users is to connect with their previous offline social circle. Many other researchers agree with the theory that Facebook requires a prior social circle to have the best experience. (Droguer, 2011; Bumgarner, 2007; Lyndon, 2011; Pempek, 2008). Herman (2019) states that TikTok has no social circle requirement. Other research on TikTok motivation claims the same as well. (Omar and Dequan, 2020; Bresnick, 2020). These theories can be attributed to the fact that users on Facebook have to be more social and have a close network to be able to use the platform, which may lead to more extroverted individuals favoring Facebook. Users on Tiktok don't necessarily need a social network, so potentially more introverts and insecure users will favor TikTok. The Facebook algorithm appears to continue sticking with the social network requirement to fully engage with the platform, while TikTok is currently seeing and is predicted to continue having massive user

popularity. Therefore these sources theories and results seem to be valid in the current standards.

In terms of motivations for businesses specifically, Swani (2013) states that businesses on Facebook are primarily motivated on focusing through Word of Mouth marketing. At the same time, De Veirman, Hudders and Nelson (2019) claimed businesses on TikTok focus more on paid influencer shoutouts to generate the most revenue. This difference in marketing can be attributed to the fact that Facebook focuses more on a social circle, which is more favorable for businesses who have an existing clientele or customer base in their social circle. This word of mouth marketing from their social circle to outside of the social circle helps generate more revenue. On the other hand, TikTok doesn't require a social circle so a business's previous clientele doesn't play as much of a role and isn't as favorable to a business on TikTok. What is more favorable is influencer shoutouts which drive more traffic to a business's product or service generating more revenue for a business on TikTok. Considering businesses are still posting today on Facebook and relying on Word of Mouth marketing while influencers on TikTok are still shouting out certain products, the sources appear to be valid in today's social media market.

While the general user motivations behind each respective platform appear to be similar in all sources, the deep specific motivations interpreted by each source was different. For Facebook, Ross (2008) stated Facebook was mostly a tool for communication among a social network. Droguer (2011) theorized Facebook was used to connect with individuals a user may have forgotten otherwise. Bumgarner (2007) claimed Facebook was mostly used for gossip and talking about other people's profiles. Lyndon (2011) stated that Facebook was used primarily to stalk previous romantic relationships. Finally, Pempek (2008) theorized Facebook was used to establish an identity in a user's social circle. On the other hand for TikTok, Herrman (2019)

stated users favor TikTok solely because it requires the least amount of attention or emotional attachment. Omar and Dequan (2020) claimed TikTok was mostly used as TikTok is an opportunity for self-expression without needing a social circle. Finally Bresnick (2020) stated TikTok's advanced video editing features made it a "virtual playground" that helped younger generation users find a form of creative expression. So although for both platforms, the general motivation is clear, the individual specifics of the motivation is still not a majority conclusion. This could mean there hasn't been enough research done, or could be caused by the hypothesis that every user is different in social media which lead to the motivations behind each user to be unique as well. Although social media algorithms constantly change, the motivations for each platform appear to remain consistent throughout time so the sources appear to be valid for today's age.

While there are hundreds of sources of research on the motivations behind specifically college students on Facebook, there isn't much known research on the motivations of other Facebook or TikTok users in general. There also isn't a lot of known research on how either platform's algorithm specifically plays a role in user motivation. Facebook has been one of the most popular social media platforms for over a decade now and TikTok is one of the most rapidly growing social media platforms out there. Knowing the motivations behind each platform will give content creators, advertisers, and brand sponsors more of a holistic view on their social media strategies as well having an overall edge over the competition when the motivations of Facebook users versus TikTok users are clearer.

STS Framework and Method

My STS investigation will use the SCOT framework. Because SCOT analyzes the

diverse perspectives from not just designers or system builders, but also users, I believe SCOT is the most applicable STS framework, as my research focuses primarily on users and their motivations, compared to each respective platform's design team or specific technical systems.

The first step in using the SCOT framework is identifying RSG's. For my specific investigation, the RSG's are the following: TikTok Users, Facebook Users, The TikTok Team, The Facebook Team, TikTok Paid Sponsors, Facebook Advertisers, TikTok Content Creators, and Facebook Content Creators.

Now in terms of how the various RSG's interpret their respective social media platforms and the problems it tries to address, TikTok users mostly use the platform to pass time and consume engaging content. Facebook users use the platform to connect with friends and be up to date with their social circle. The TikTok team just wants to have the most addicting app with the most user use-time. The Facebook team wants to have the most popular app overall in the social media market. Both TikTok Sponsors and Facebook Advertisers just want to create the most amount of revenue from their paid sponsorships and advertising. TikTok Content Creators want to maximize TikTok's organic reach, build the largest possible following, have the most amount of engagement per post, and build an elite brand for paid sponsorships. Facebook Content Creators want to build their following and engagement as well, while a certain subsection of Facebook Content Creators also want to build a brand for a monetizable business.

With the different RSG's interpreting their respective social platforms and addressing problems in different ways, the various RSG's have to negotiate their differences as well. TikTok users simply swipe to the next piece of content if the content isn't engaging. The users' likes, comments, shares, and watch time also play a huge role in content shown. Facebook users can

dislike pieces of content. Just like TikTok Users, Facebook users' reactions, comments, and shares play a huge role as well. Facebook users can also unfriend any member of their social circle as well. The TikTok team wants to design the most addicting algorithm to have the most use-time out of any social media app. The Facebook Team just wants to design the most favorable social media platform in the market. TikTok sponsors want to find the best influencers to generate the most amount of traffic to their product or service. Facebook Advertisers adapt and comply with the advertising rules laid out by the Facebook team. TikTok Content Creators adapt to what the audience wants, as each individual post focuses more on quality content than simplifying relying on a previous social circle to engage. Facebook content creators also adapt to what the audience wants, but more adapted to a user's offline social circle.

There is a closure mechanism to settle the debate, allowing certain solutions to be accepted and implemented. For Tiktok, if a Content Creator's content is engaging, the TikTok team is happy with the quality content and organically shows it to more TikTok users. With the content having higher organic reach, the Content Creator is happy reaching more people and building up a larger following. The user is happy being shown the most high quality content. Finally the advertisers are happy because there's a larger source of traffic of users to advertise to. For Facebook a very similar scenario applies. If a Facebook Content Creator's content is engaging, Facebook is happy recognizing the engagement and shows the content to more of the content creator's social circle. The Content Creator is happy having more reach and engagement. The user is happy being shown the best possible content from their social circle. Finally the advertisers are happy because there is a larger source of traffic to market to.

Methods for Data Collection:

For my research methods, I will be conducting both surveys and interviews. Surveys will obtain a larger sample of data compared to interviews, and are also an efficient way to measure a wide variety of unobservable data such as stated preferences, traits, beliefs, behaviors, and factual information needed to understand the user motivations for both Facebook and TikTok. With my social network, I can also interview interns and employees at Facebook. The interviews will help go more in depth of how the Facebook algorithm works and how the algorithm specifically plays a role in user motivation. The same open-ended questions are asked to all interviewees. This approach facilitates faster interviews that can be more easily analyzed and compared.

I will target users around college students around the ages of 18-22 to limit confounding variables. As most TikTok users are around the ages of 13-22 and most Facebook Users are around the ages of 18-34, there is an overlap between users of both platforms with an age range of 18-22. I will ask for qualitative and quantitative data in both my surveys and interviews. Qualitative data will consist of average use-time of each social media, amount of content produced per platform, and how much time spent creating content if applicable. Quantitative data will consist of which social media platform out of the two is preferred, why a user prefers one platform over the other, and what specific parts of the platform's algorithm makes it preferable.

Now there may be some bias. I might have some selection bias asking people in my social network who may have similar interests with one another. Also some answers may be more in depth or more accurate than others, as revealing true social media platform motivations can be embarrassing to reveal depending on what the answer is.

Timeline

I plan to have a timeline of a semester's worth of 15 weeks to conduct research during this period. The goal during this time frame is to understand the motivations of Facebook Users versus TikTok users on a social, psychological, and algorithmic level. At the end of the 15 weeks, I will deliver a Thesis going into depth about the approaches I conducted, my evaluations, and future steps.

Conclusion

Facebook has been one of the most popular social media platforms for over a decade now while TikTok is the most rapidly growing Social Media platform. Knowing on a deeper depth the motivations behind Facebook users compared to the motivations of TikTok users will help for a better prediction of how users interact online and the direction of social media and will be moving toward for years to come.

The purpose of the study will address the differences in motivations of Facebook users compared to the motivations of TikTok users. The study attempts to answer five questions. First, who are the users? Second, what is the purpose of spending time on the platform? Third, what role does offline friendships play in the platform? Fourth, How do the algorithm and user interface design differ? Finally, how do the different algorithm designs attract different users? Breaking down the research into these five questions will help make the results cover all necessary aspects of a detailed investigation.

The SCOT framework was chosen as the research framework of choice. Since SCOT analyzes the different perspectives from not just designers or system builders, but also users, SCOT is the most applicable STS framework, as the research focuses primarily on users and their

motivations, compared to each respective social media platform's design team or specific technical systems. At the same time, both surveys of 18-22 year old college students and interviews of Facebook interns and employees will be conducted as the research method of choice. Surveys will help obtain a larger sample of data compared to interviews, and also an efficient way to measure a wide variety of unobservable data to understand the user motivations for both Facebook and TikTok. The interviews will help go more in depth of how the Facebook algorithm works and how the algorithm specifically affects user motivation.

Having users of both Facebook and TikTok be more aware of their motivations behind each platform will only provide more benefits. Awareness is the first step to solving a problem. So if a user does eventually have any problems with Facebook or TikTok, they'll have the knowledge of why they use the platform and if they can fulfill their motivating needs elsewhere.

Understanding a user's motivation for a certain social media platform doesn't only apply to Facebook or TikTok. Knowing on a deep level the user motivation of a social media platform is important for any social media, as every platform has their own algorithm and specific types of user motivation. Niching down to Facebook and TikTok will just give more of an understanding why users favor a certain algorithm over another, and potentially which direction Social Media will be heading towards in the future.

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