P5, Interfaces and Politics

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1. DESIGN CHALLENGE, COMPUTER SCIENCE PROMPT

GATech offers online master's program like computer science, cyber-security, and analytics. Like many of those programs, the OMSCS program is a great resource for various educational aspirants around the world. The OMSCS programs are predominantly targeted for an individual who like to pursue their graduate studies part-time. However, it is not necessarily that an individual should be exceedingly exceptional in their computer science knowledge, they can be of any profession, but still can pursue OMSCS if they are interested in science and technology.

1.1 Positive Impacts

- *Cutting Edge Specialization:* The OMSCS program offers various specialization like the machine learning, interactive intelligence, computation perception, robotics, and computing system. Individuals can plan to work on their course to earn one or more of this specialization that they are interested.
- *Convenience:* The program is structured with around 60 courses to choose based on the specialization(s) and of course, foundational courses. These courses demand moderate to high workload, students can choose a course based on their work and personal commitments for that semester.
- *Global presence:* The program doesn't have any requirement to be on-campus, so it is structured to apply from any part of the world. Obviously, International students have more protocols to follow during the application process, but once enrolled, they are not discriminated based on their nationality, rather everyone's treated equally.
- *Communication:* The instructors of each course are top-notch; they have great expertise on their instructed or created courses. Communicating with them is flexible using Ed discussion, Slack, Teams, or emails. Imagine studying from any corner of the world and communicating to professors, staff, and teaching advisors who are doctorates, masters in their profession can help motivate a student and enlighten their career to higher level.

- *Cross functional learning* happens where students from various profession can share their knowledge through Peer review, feedback, and the other day to day forums and discussion that can help fellow classmates. Weekly assignments and tests keep a student sharp and focused on the course, grades, and feedback makes them feel accomplished.

1.2 Negative Impacts

- *Socializing*: Communication and team building is a major concern when compared to on-campus students. It's up to the student to decide whether to communicate with professors, staff and peers, there is no actual need to be a participant. This would impact a student's socializing skills when it is required.
- *Discipline*: A higher percentage of the students dropping out due to lack of motivation and commitments. Personal, work, and other family obligation could potentially impact the commitment and end up with lesser grades, or eventually dropping out.
- *Accountability*: Though spending hours in studying and committed towards the courses, when it comes to accreditation, are online courses credible in the society is still a question on many students' mind.

1.3 Preserve Positive Impacts

- To preserve positive impacts, the factors can be emphasized to the students more frequently through communication because the program could go anywhere from 3-6 years and motivation can downplay resulting in dropping out.
- Upgrading lecture materials, assignment structure, grading pattern, interactive lectures with professors or staff members could add additional value on the focus towards the program.

1.4 Mitigate Negative Impacts

- Though the OMSCS program has a way to interact with peers through Ed discussion, team-building activities within similar demographics or virtual can be organized to improve socializing.
- Counseling by instructors and the staff team can help students more focused and providing additional time when required for assignments could help motivate the students to stay on course.

- Endorsements and Testaments by former students, who capitalized the OMSCS program for their career can help current students understand the credibility of the program in the society.

2. POLITICS, COMPUTER SCIENCE PROMPT

In Enterprise organizations, where there are multiple hierarchies of management, and their direct reports have a team that focuses on their area of expertise and application. These systems and their designs are tightly coupled within their group and when there is a need to cross-collaborate with external teams, not all the teams want to do that. There is always a gap in communication, discrepancies, disagreement on ideas which could lead to politics at an organizational level. Whether it is healthy or not, a positive work culture depends on how these politics are handled with different stakeholders involved. I had worked on one such application where it involves multiple stakeholders at the leadership level, the architect level, and the business level where my part was to be leading the team along with core development.

When you are leading a team, we must face these encounters from different stakeholders on the design proposed, the challenges in infrastructure, adapting the team members for the change, learning curve on new technologies and so on, I had to digest and process these inputs from different stakeholders, frame them into a prototype that all stakeholders would come to agreement on. The application that I am referring here is one of my previous applications that I had a chance to lead. It was designed and used for one LOB, but later envisioned to be used at the organization level, which would obviously bring some changes for the application.

2.1 Leadership Level Stakeholders

The application is a high visible, most productive and watched one across the organization on Conversational AI and Annotation. It was a powerful application on a particular business domain and the leadership team wants to expand that to other business domain across the enterprise. The *motivation* of the leadership was to expand the application to the other business domain in a cost-effective methodology. Due to the budget constraints, infrastructure or resources cannot be increased, but still it should be converted to a framework application that can be used across business domains. The end-to-end application was built with Django

framework and the current infrastructure is not efficient to be converted into a multiple business domain application. This ended up *impacting* the application and redesign of technology which was already well established within the team.

2.2 Architect Level Stakeholders

The application had a well-formed architecture of Python based Django framework for frontend interface and backend data manipulation, Mongo database and communicating to networking nodes called as clusters. This was a proof of the concept provided by me and ended up designing the application with architectural approval after much scrutiny. The Architecture team while discussing redesign of expanding the application to multiple domains, they got *motivated* to completely scrap and start the application from scratch using Java. This could lead to a valiant effort on designing an application, the learning curve, the visibility into vain. The redesign got *impacted* due to the fact of changing the entire architecture from Python to Java which would involve infrastructure changes, learning curve for the team, complete rework of all modules.

2.3 Business Level Stakeholders

The application was originally designed for one line of business (LOB). They are well-trained about the application interface on key features, annotating the conversation, upload files, ground truth and more. The LOB has a certain set of rules to be applied, the interfaces act based on those rules, the current framework supports that, and the LOB doesn't want to change that. When new LOBs are introduced, the interface could lead to some changes, the current LOB teams are *motivated* based on that fact since they don't want to make any change to the current interface that could significantly impact their application workflow. This *impacted* the application in redesign of any new interfaces that could serve other LOB.

Politics brought by these stakeholders is something making the redesign challenging, but everyone has their own motives to play their part which is agreeable. It would make through more iterations of communicating with the stakeholders on a common approach, but eventually we will be there. The value-sensitive design principles can be followed like brainstorming interface possibilities, considering indirect stakeholders, and knowing your users can be followed to mitigate the risk on this design and its politics.

3. ACM CHI CONFERENCES

3.1 Paper: Let's get physical

Title: ControllerPose: Inside-Out Body Capture with VR Controller Cameras

Authors: Karan Ahuja, Vivian Shen, Cathy Mengying Fang, Nathan Riopelle, Andy Kong, Chris Harrison

Virtual Reality is in the process of taking technology to the next level. Gaming, Interactive physical training, yoga, and meditation are some of the key focused interfaces in VR and now it focuses on medical sciences, manufacturing, architecture and more. ControllerPose could be a great addition to the VR ecosystem when it becomes materialized with more iteration of studies and research with HCI principles. The article talks about picking a problem of capturing motion of the only upper body in the current VR interfaces. ControllerPose integrates camera to the handheld controllers through which motions can be captured digitally using IMUs, accessory sensors and converted into 3D pose evaluation, then to an avatar that can be integrated into all user application. These application interfaces can be enhanced with additional features that would require leg-centric motions. Some of the examples being kicking soccer balls, yoga, and more gaming activities.

The article talks about following HCI principles like needfinding, design alternatives, evaluation, prototyping, datasets, requirements, and heuristics. It uses the participant model where the users are novice and have been provided certain guidelines to be followed in evaluating the prototype. It uses a *working model prototype* where the device captures the different body poses to make it as 3D pose and make it an avatar using composting and estimation pipeline. It also proves that researchers are unbiased, finds a way to enhance the working model and product would need more iterations of HCI principles to make a better product to be used by demographics of users.

The reason behind me choosing this article is the interest towards virtual reality interfaces. Outdoor physical activities help humans in having a healthy lifestyle, stress-free and refreshing, but that is based on people's interest. There are certain individuals who like to spend time on gaming, virtual physical training, and workouts. ControllerPose would be a great addition for the group of people because today's VR controls makes a person sit in front of the gaming interface for

long hours with less physical activity or sometime only upper body motions, when this product is fully functional and comes to the market, it will motivate people to work on their legs that would help them stay active and less prone to diseases.

3.2 Paper: Children and Learning

Title: The Last Decade of HCI Research on Children and Voice-based Conversational Agents

Authors: Radhika Garg, Hua Cui, Bo Zhang, Spencer Selingson, Martin Porcheron, Leigh Clark, Benjamin R. Cowan, Erin Beneteau

Voice recognition products has evolved since its inception back in 2010. The evolution is truly based on various research and studies performed by aspirants around the world. Though the common language that was used for evaluation during the initial stages was only English, it gradually changed to other languages, dialects, and voices from different ages. Today it's been widely used by children when they need information on any areas they would like to explore or sometimes just for interpersonal relationship. The current voice-based dialogue systems help children and the device to converse back and forth, this is done through Natural language processing, conversational AI, automatic voice recognition, annotation, and text-to-speech synthesis.

The article discusses about voice-based conversational agents focusing to develop heuristics for child interaction with conversational agents. The children would be on different cultures, diversity, linguistic and should work on different domains or contexts, but still would be able to interact with the product or system. To do this, the first method is to perform Systematic Literature reviews of HCI research helps in getting analysis of speech interface studies performed in the past 10 years which also had some inclusion and exclusion criteria. Evaluation is made using the Wizard of Oz studies, working model prototypes with children from different countries and different ages by using specific keywords, this is a predictive model approach. The research would target themes that would be considered because of the study. The themes include, but not limited to human-like qualities to CA, children learning and play support, CA playing a part in the family.

The reason behind choosing this article is based on my kids at home using Google Assistant to have interaction. It doesn't mean kids are not interacting with family and friends, but they treat Google Assistant as a fun companion that can give

information, converse, play songs, read a book, announcements, timers and more. The curiosity on the technologies that works behind voice recognition products, software, and hardware made me read this article and can some day share the knowledge to my kids who are using the technology more than me.

4. SPECIALIZED CONFERENCES ABOUT HCI

4.1 Spatial User Interaction 2019

Title: Minuet: Multimodal Interaction with an Internet of Things

Authors: Runchang Kang,Anhong Guo,Gierad Laput,Yang Li,Xiang 'Anthony' Chen

Homes are occupied today with a lot of smart devices starting from light bulbs, swirtches, fans, robovac, kitchen appliances, furniture and more. They can all be controlled by voice assistive devices like Alexa, Google, Siri and more which is referred to as Internet of Things (IoT). Voice recognition is working well, and they are called as Auditory sensors on HCI principles. These smart devices are looking towards the future of multi-modal interaction. The article states about using a 2D projected display, that would read hand or foot gestures as commands and can interpret them and act accordingly. The interface that is going to convert these into proper commands are our voice assistant devices. Minuet follows participant observation on needfinding with 10 participants performing voice and gesture-based commands, then design space examples of spatially distributed IoT. The qualitative study, analysis and results have stated that they are composed of two components Selection and Interaction where selection is selecting a device and Interaction is how you converse for voice commands to the device.

The reason I got interested in this paper is due to the same problem statement the authors have mentioned. Due to the increasing load of smart devices and application, it is hard to open each application and tap each device control (haptic sensing), so voice assistant devices add as a mid-layer interface to help execute the commands, but exploring more options are always on the card for researchers.

This led to the experimentation of gesture sensing which would help immersive to control household smart devices with hand or body gestures.

4.2 International Conference on Interactive Experiences for TV and Online Video

Title: What Are Others Looking at? Exploring 360◦ Videos on HMDs with Visual Cues about Other Viewers

Authors: Ville Mäkelä,Tuuli Keskinen,John Mäkelä,Pekka Kallioniemi,Jussi Karhu,Kimmo Ronkainen,Alisa Burova,Jaakko Hakulinen,Markku Turunen

Virtual reality has become one of the technological innovations for the future in all aspects of the world. It gives tremendous experience for users to be there in the actual environment. A Time machine could be a possibility in the future with Virtual reality, Augmented reality, Spatial Audio, Voice recognition and Cloud platform. The article talks about using a head-mounted display to get into a video with 360-degree view and can cue other viewers too. It's more of a study based on enhancing user experience while watching videos, just like 7.1 and Atmos speaker provides 360-degree sound, this interface can help in getting video using head mounted display. It would be fun and entertaining to be placed in a video which was already filmed.

The article follows HCI principles with implementation of shadow and social indicators, gaze data clustering which helps to enhance the experience than the ordinary HMD. It follows predictive modeling by having 30 participants and showing videos to analyze and provide feedback.

The reason I got interested in this article is due to the interest towards movies. It would be a great experience to do a 360-degree view of any movie or sport or videos while watching leisurely.

5.REFERENCES

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