**Intelligent UI Agent – Enhancing UX for Windows**

**Abstract:**There is an increasing research interest in developing Intelligent Agents (IA) that improve user experience (UX) for popular systematic tasks entailing personal computer systems. In Windows-type computers, a major suite of user actions from desktop UI constitutes access and processing of files and folders, viewed as icons on UI. We propose an Intelligent Agent to enhance user experience on actions involving such operations with UI icons. This is achieved by monitoring and learning user activity of all icons during log-in, denoted by the following features: access frequency and usage duration. Further, we formulate a score function that maps those features into binary actions for the IA; where a high score moves the icon to the middle area and a low score moves the icon towards borders. Additionally, the user-driven drag-and-drop feature on icons is included in the model and referred to as long short-term feature. The proposed framework of IA that automates desktop UI is a user-specific solution that shows promise for High-Density UI, clutter with dense files, frequent access, and multi-user log-in sessions.

**Keywords: User Experience, Intelligent Agent, Intelligent Assistant, Desktop UI, Priority, Clustering**

**Section 1 - Introduction**

Since the inception of computing, significant transformations have been witnessed in the landscape of operating systems (OS). Dating from the era of mainframes to the current ubiquitous presence of personal computers, the operating system has played a key role in mediating between the hardware and the software. While a considerable amount of attention has been directed towards the enhancement of the overall efficiency of the OS, the primary interface, that is the desktop level, has not seen any significant improvement and innovation.

The landscape of user-experience-based intelligent assistants and desktop UI development has historically seen limited innovation. Nevertheless, there have been some noteworthy contributions in this field that have illuminated the key challenges that are being faced and have also laid the foundation for addressing them, enhancing user interaction at the desktop level. Hitesh Dhiman [ ] in one of his papers on intelligent assistants, describes the evolution and design of the intelligent assistants and the various domains where they can be utilized. In another research, Sabina-Cristiana Necula [ ] has investigated the extent of usage of Artificial Intelligence in recommender systems and the future trends possible in this field. Furthermore, in another research Qian Zhang [ ] presented observations and challenges in the field of recommender systems using AI, giving new directions and solutions to overcome those issues. Although there has not been much development in the field of user experience-based desktop environments, few researches such as Artificial Intelligence-based Desktop partner [ ] have shown the development of Virtual Personal Assistant with automation using human voice using the concept of Natural Language Processing.

The traditional desktop environment has not seen many changes and innovations in other aspects of computing. This static behaviour has led to significant challenges for the users to organize and access their files, asking for an intelligent solution to serve this problem. The desktop plays a pivotal role in user interaction and actions. Desktop user interface (UI) provides a way for users to interact with the computers regularly and is the first point of contact for users to interact with their systems. The importance of a robust desktop UI becomes evident in the scenarios where there are dense data clutters, data centres with high usage, multi-user log in activity. Thus, this brings a need for a well-designed UI Agent to enhance the user experience for windows type computers. Our research tries to address this gap by introducing an AI-powered desktop for prioritizing client access. By amalgamating user-centric design principles with that of artificial intelligence, our project aims to revolutionize file prioritization and accessibility. We aim to understand user activity using various features such as the frequency of access and the duration of usage to determine the priority of files and folders to personalize the data and increase the efficiency of user access. Our innovative solution uses a scoring mechanism based on these features to group the files based on the high and low scores by a clustering algorithm.   
This research aims to provide various contributions in the field of Intelligent UI Agents for Desktops for enhanced User-Experience, such as:

1. Incorporation of a sticky note feature directly in the desktop environment to increase user productivity by giving the facility of reminders and comments.
2. The agent provides use case diversity by addressing challenges due to dense clusters for places like call centres, banks etc. with high usage, multi-user access and frequent usage, thus providing a scalable and personalized option for each user.
3. Efficient access and usability of files are facilitated by the adaptive arrangement of icons dynamically.
4. User-driven drag and drop feature to allow users to move the files according to their preference and prioritize the files based on their selection.

**Section 2 – Proposed Methodology and Work**

While accessing the desktop UI, several use cases are incurred by the user. Some files or documents are frequently accessed by users and they may find it difficult to search for those files and folders again and again. Secondly, in the case of multiple users accessing the interface, personalization is lacking for usage making it less convenient. Also, in high-density clutter scenarios arise where finding the right files and folders becomes time-consuming. Therefore, the lack of a personalized organization of files and folders is felt which can enhance user experience, provide scalability, save time, and personalized experience for each user to enhance the overall efficiency of the system and work. We try to overcome these issues faced on a daily basis with our solution.

In this paper, we propose an Intelligent UI Agent to enhance the User experience for Windows-based systems. In our computing systems, we have the operating system which acts as an interface between the software and the hardware. The user interface on the other hand is the point of interaction between the client/ user and the software and hardware. Our proposed intelligent UI agent sits between the UI and the Operating System, as shown in the Fig 1 [ ]. The IA is responsible for prioritizing and arranging the files and folders on the desktop based on user activity and their preferences, for easier accessibility and increased efficiency. The score function generated to map the features gives high scores for the most important documents or icons which are dynamically moved to the centre of the desktop while the ones having lower scores are moved towards the borders.

A diagram of a computer program

Description automatically generated

Fig 1.

In this section we describe our proposed methodology and work. For creating this intelligent agent, our first task is to create/ set files and folders on the desktop and save their metadata for monitoring and learning user activity. The metadata a of these documents contains information such as the click count for getting the access frequency and the time durations along with their coordinates. This metadata is now utilized for clustering and prioritizing the folders so that they can be grouped based on user personalization.

**References**

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