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Lab#01

Lab Report: Introduction to HCI and Integration with Computer Graphics

Purpose of the Lab

The purpose of this lab was to introduce the fundamental concepts of Human-Computer Interaction (HCI) and explore how HCI integrates with Computer Graphics (CG) in modern technologies. The lab emphasized understanding user-centered design principles, evaluating design examples, discovering wireframing tools, and discussing the role of interaction in CG applications like virtual reality and video games.

Task 1: Introduction to HCI

1. Discussion

What is HCI and Its Importance?

Human-Computer Interaction (HCI) is the study and design of the interaction between people (users) and computers. It focuses on creating systems that are efficient, intuitive, and user-friendly. HCI is important

because it ensures that technology serves the needs of users, improves productivity, reduces errors, and enhances user satisfaction.

Key Components of HCI

- **User:** The person who interacts with the computer system.
- **Computer**: The system or device (hardware and software) with which the user interacts.
- **Interaction:** The communication between the user and the computer, involving inputs (e.g., clicking, typing) and outputs (e.g., displays, sounds).

Examples of Good and Bad HCI Designs

- **Good HCI Design:**
  - **Google Search:** Simple, fast, and intuitive interface.
  - **Spotify App:** Easy navigation, personalized playlists, clean design.
- **Bad HCI Design:**
  - **Old Banking Websites:** Complicated forms, confusing navigation.
  - **Overloaded Mobile Apps:** Apps with too many options and small buttons making them hard to use.

2. List of Wireframing Tools

- **Figma:** Cloud-based, collaborative design tool.
- **Adobe XD:** Popular for creating interactive wireframes and prototypes.
- **Sketch:** Mac-only tool known for vector UI design.
- **Balsamiq:** Low fidelity wireframing tool for rapid sketching.

- **InVision:** Focuses on prototyping and collaboration.

Task 2: Integration of HCI and CG

Discussion

How HCI and CG Work Together

In applications like virtual reality (VR), augmented reality (AR), and video games, HCI ensures that user interactions are natural and intuitive, while CG creates visually appealing and realistic environments. Good HCI design enables users to easily control and navigate CG worlds, making the experience more immersive and engaging.

Role of User Interaction in CG Applications:

User interaction is crucial in CG-based applications. It determines how users:

- Move within virtual spaces (e.g., VR headsets, motion controllers).
- Interact with digital objects (e.g., touchscreens, gestures).
- Receive feedback (e.g., visual, audio, or haptic).

Post-Lab Questions

1. Key Differences Between HCI and CG

- HCI focuses on how users interact with technology.
- CG focuses on how visual content is generated and displayed.
- **Complement:** HCI ensures users can effectively interact with CG environments, while CG provides the visual feedback users need.

2. Why is Usability Important in HCI?

Usability ensures that systems are easy to learn, efficient to use, and satisfying.

Examples:

- **Good Usability: Google Maps:** intuitive navigation, clear directions.
- **Bad Usability:** Overcomplicated e-commerce checkout pages leading to abandoned purchases.

3. Challenges of Creating Realistic Computer Graphics

- **Challenges:**
    - High computational cost.
    - Realistic lighting, textures, and physics simulations.
    - Achieving smooth, real-time rendering.
- **Impact:** Poor graphics realism can break immersion and frustrate users, negatively affecting user experience.

4. Reflection on Tools Used

- **Easy:** Using Figma's drag-and-drop interface to create wireframes.
- **Difficult:** Learning advanced features like interactive prototyping or component libraries in Figma and Adobe XD.

Conclusion

This lab highlighted the importance of designing user-centered systems and the crucial role of integrating HCI with CG in modern digital experiences. The practice with wireframing tools and discussions about real-world applications provided a strong foundation for understanding how to create effective, engaging user interfaces.

THE END