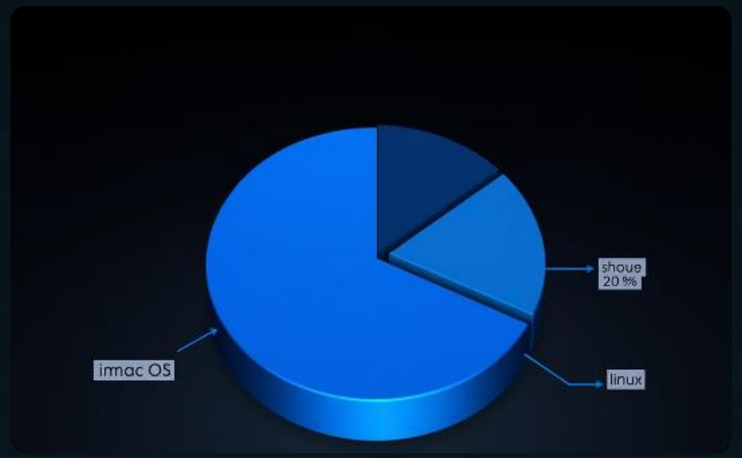
Lecture 4

Operating Systems and GUIs: Part 1

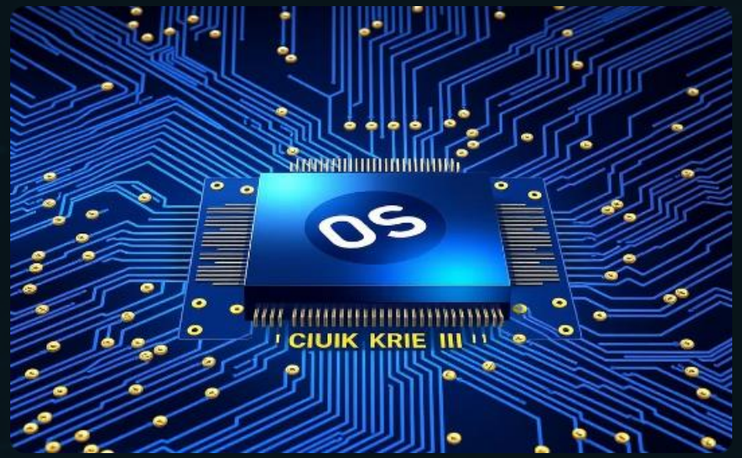
by : Asst. Lect. Ali Al-khawaja

What is an Operating System (OS)?

An Operating System manages hardware and software resources, acting as an intermediary for user applications.



Examples include Microsoft Windows (73%), macOS (15%), and Linux (3%) by market share.



The OS kernel manages CPU scheduling, memory allocation, and input/output device control.

User Interface (UI) Basics

Interfaces Defined

User Interface (UI) is the medium through which users communicate with computers. It encompasses both command-line and graphical styles that enable commands and feedback.

CLI vs. GUI

Command-Line Interfaces (CLI) rely on text commands typed by users, suitable for advanced tasks with tools like Terminal or Command Prompt. Graphical User Interfaces (GUIs) employ visual elements including icons, windows, and menus to provide intuitive interactions, exemplified by Windows and macOS.

Historical Milestones

The first GUI was pioneered by Xerox Alto in 1973 and later commercialized by Apple Lisa in 1983, revolutionizing user engagement by making computing accessible to a broader audience.

The Power of GUIs

Intuitiveness

GUIs lower the barrier for beginners by providing visual cues and straightforward navigation, enabling users to accomplish tasks without memorizing commands.

Visual Simplification

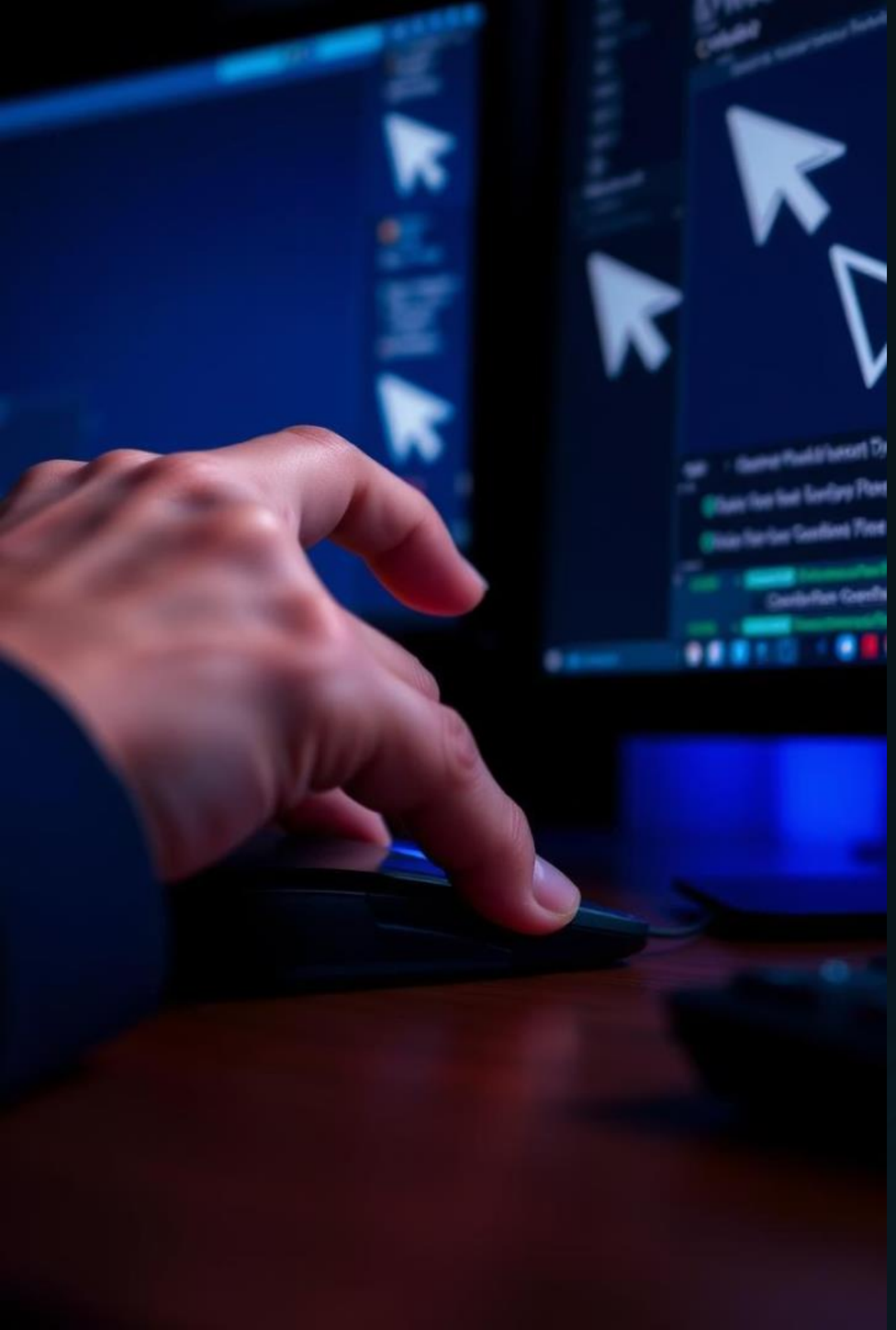
By translating complex operations into icons and windows, GUIs simplify workflows and decision-making, enhancing productivity and user confidence.

Direct Manipulation

Users can interact directly with on-screen objects through pointing, dragging, and dropping, receiving immediate visual feedback, which enhances engagement and understanding.

WYSIWYG

The 'What You See Is What You Get' interface enables real-time visual editing, particularly valuable in document creation and graphic design, ensuring outputs match user expectations precisely.



Mastering Mouse Techniques

Pointing

Moving the cursor across the screen to indicate objects or locations for interaction.

Clicking

Using the left button to select or activate elements, and the right button to open context-sensitive menus.

Double-Clicking

A rapid succession of two clicks, typically used to open files or launch applications.

Dragging

Clicking and holding the mouse button while moving the device to reposition objects or resize windows.

Common Iconography

Folder Icon

Represents directories used to organize files hierarchically.

Document Icon

Visually indicates specific file types such as text documents or spreadsheets.

Trash/Recycle Bin

Symbolizes file deletion and temporary storage before permanent removal.

Gear Icon

Denotes settings or preferences, allowing users to customize software behavior.

Magnifying Glass

Commonly used to represent search functions within applications or systems.

Demystifying the Status Bar

Location and Visibility

The status bar is typically positioned at the bottom of the screen or application window, providing persistent visibility of essential system information.

Purpose

It displays current system statuses such as time, volume levels, network connectivity, battery life, and notifications about running applications.

Utility

This constant feedback aids users in quickly assessing system health and performance without interrupting workflow.

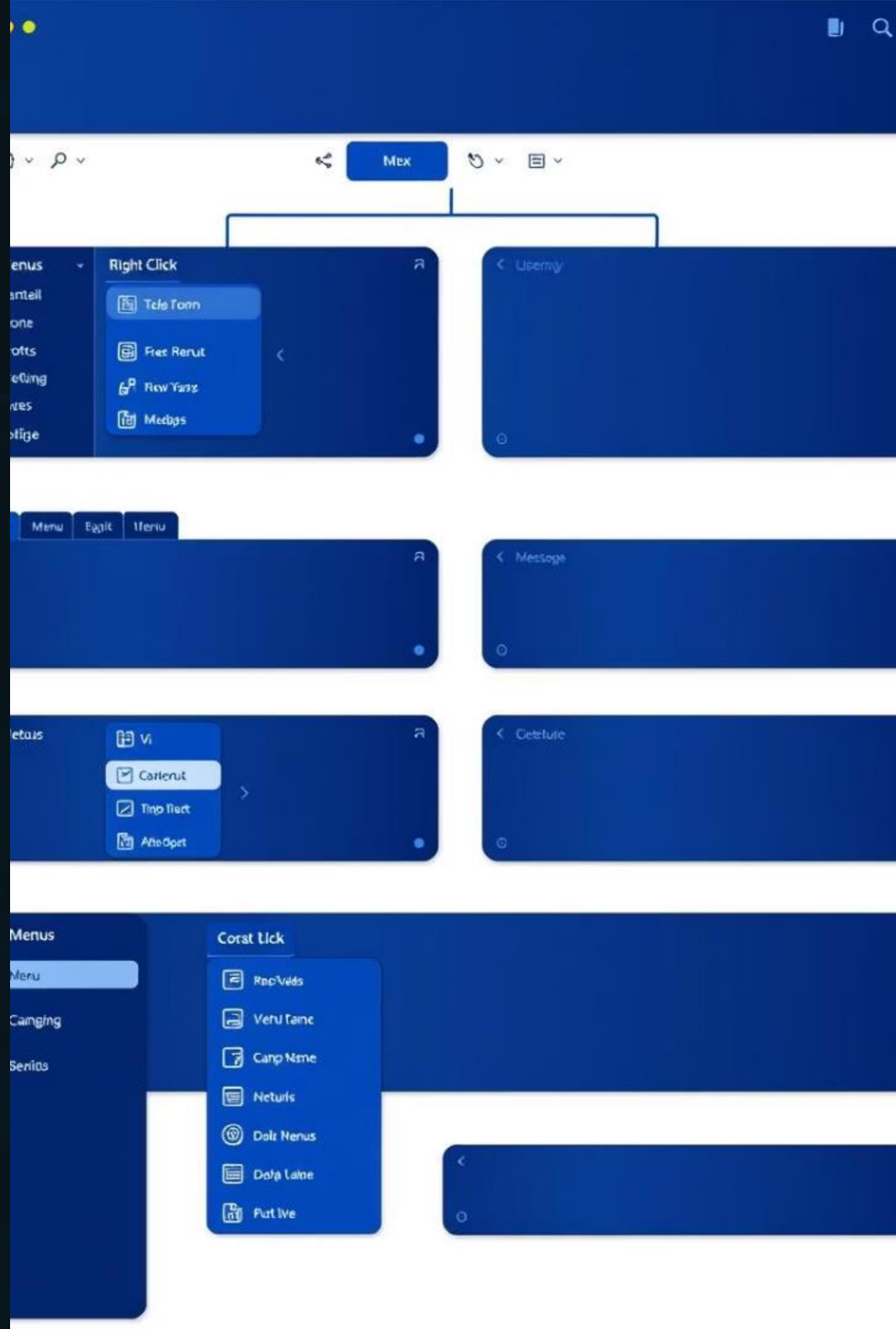
Menu Structures

Hierarchical Organization

Menus display commands and options in nested hierarchical lists, enabling structured navigation through the application's features.

Types of Menus

- Menu Bar: Typically found at the top of the application window, with categories like File, Edit, and View.
- Context Menus: Opened by right-clicking, they provide options relevant to the current context or selected item.
- Drop-down Menus: Expandable lists that reveal sub-options within a menu category.



Navigating Menus Effectively

Keyboard Shortcuts

Accelerate interaction through combinations like Ctrl+C (copy), Ctrl+V (paste), and Ctrl+S (save), enabling efficient command execution.

Access Keys

Menus often underline specific letters, allowing users to activate menu items using the keyboard by pressing Alt plus the underlined letter.

Menu Organization

Effective menu design groups related commands logically, enhancing user comprehension and ease of locating desired options.

Summary and Next Steps

Core Concepts Recap

Operating Systems manage hardware/software resources; User Interfaces bridge human-computer interaction through visual and command-line methods.

Essential Interface Components

Mouse techniques, icons, status bars, and menus form the foundational tools for effective interaction and command execution in GUI environments.

Looking Ahead

The next phase will explore system customization, detailed settings management, and advanced GUI features to empower comprehensive user control.