

CHALKBOARD

Empowering Vision with Intelligence

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Advanced Visual Intelligence

Chalkboard is an extensible OCR and Vision Intelligence platform designed for maximum accessibility. It provides a structured view of content that is visible on the screen but not focusable or reachable by standard screen readers, transforming static images and inaccessible interfaces into organized data that can be explored and queried.

Key Use Cases

- **General OCR:** Instantly read text from images, PDFs, or applications with custom graphics that screen readers cannot detect. Use *AI Refine* to turn messy data into clean, navigable tables and lists.
- **Smart Compare (Alt + 3):** Navigate inaccessible web forms and apps with confidence.

***Scenario:** Before clicking a "Submit" or "Action" button on an inaccessible website, set your baseline (**Alt + 2**). After clicking, use **Alt + 3** to compare. Chalkboard will detect and read any new visual changes, such as error messages or hidden dialogs that the screen reader failed to focus.*

Core Capabilities:

- **High-speed Offline OCR:** Extract text locally using Tesseract.
- **AI Refinement:** Convert raw text into structured HTML (headings, tables, lists).
- **Visual Querying:** Use AI to ask specific questions about any visible element.

- **Smart Compare:** Analyze differences between captured screen states.

Start in 30 Seconds ⚡

Get up and running immediately with these three steps:

1. **Run:** Install Chalkboard using the MSI or simply open the `chalkboard.exe` file.
2. **Setup AI:** Open Settings (`Ctrl + ,`), enable **Gemini** in the AI Providers tab, and paste your key from aistudio.google.com.
3. **Explore:** Press `Alt + 1` to capture a new workspace, or use `Alt + 2` (set baseline) and `Alt + 3` (compare) to instantly track visual changes.

Why Chalkboard?

The Challenge

Missing Structure: Standard OCR often loses headings, tables, and lists, making results hard to navigate.

Unreachable Elements: Many apps have visible buttons or labels that screen readers simply cannot focus or detect.

Dynamic Changes: Visual updates on screen often happen silently, leaving users unaware of new alerts or status changes.

Our Solution

Intelligent Structuring: AI Refine generates semantic HTML (headings, tables, etc.) for a native web-like reading experience.

Natural Language Queries: Ask the AI about anything on your screen, even if it's not a standard text element.

Smart Compare: Get instant comparison between the previous screen state and the current screen state.

Installation & Environment Setup

System Requirements

- **Operating System:** Windows 10 or later (64-bit recommended)
- **Processor:** Intel i3 or equivalent (i5 or higher recommended for better performance)
- **Memory (RAM):** 8 GB or higher recommended
- **Storage:** At least 500 MB of free space
- **Internet Connection:** Required for AI features such as AI Refine and Visual Queries
- **Offline OCR:** Requires Tesseract OCR to be installed and added to system PATH

Step 1: Install or Run Chalkboard

For users installing on their system:

1. Run the **Chalkboard (MSI)** installer.
2. Follow the prompts: **Next** → **Accept License** → **Next** → **Install**.

For users running without installation:

1. Extract the downloaded ZIP file.

2. Run the **chalkboard.exe** file.

Note: If Windows Defender SmartScreen blocks the app, click "More info" and then "Run anyway". For the portable version, ensure that all files in the ZIP remain in the same folder.

Step 2: AI Configuration (Recommended, Free option available)

To fully utilize features like **Smart Compare** and **AI Refine**, we highly recommend setting up an AI provider. Follow these steps to set up **Gemini** (recommended for best results):

1. Get your API Key:

- Go to aistudio.google.com.
- Use the **Down Arrow** to find and click the '**Get API key**' button.
- Locate the table of keys (press **T** in browse mode or use Down Arrow) and click the **Copy** button for your default key.

2. Enable Gemini in Chalkboard:

- Open Chalkboard and go to **Settings** (**Ctrl + ,**).
- Use **Ctrl + Tab** or the **Right Arrow** to navigate to the **AI Providers** tab.
- Use **Tab** to reach **Gemini** and check the tickbox to enable it.
- **Tab** to the **API Key** edit field and paste your copied key.

3. Configure Performance Settings:

- **Tab** to the **Timeout** field and set it to **120s** (or more).
- **Tab** to the **Max Tokens** field and set it to **65000** . (*This ensures long results aren't interrupted.*)
- Click **Save** or press **Alt + S** to apply changes.

Note: You can enable other providers (like OpenAI or Claude) in the same way by providing their respective API keys.

Step 3: Tesseract OCR & System Path

To use high-speed offline OCR, follow these steps to install Tesseract and add it to your system path:

1. Install Tesseract

1. Download the Tesseract installer for Windows from the [UB-Mannheim Tesseract Wiki](#).
2. Run the installer and note the installation path (usually `C:\Program Files\Tesseract-OCR`).

2. Add to System PATH

1. Press the **Windows Key**, type `Environment Variables`, and press Enter.
2. Click **Environment Variables** at the bottom right.
3. Under **System variables**, select `Path` and click **Edit**.
4. Click **New** and paste your Tesseract folder path (e.g., `C:\Program Files\Tesseract-OCR`).
5. Click **OK** on all windows to save.

Note: Restart Chalkboard after these changes for Tesseract to be detected.

Screen Reader Optimized

Usage & Navigation Guide

The Home Interface

The home screen is your central hub for starting new analyses and managing past work. You can navigate between these options using **Tab**:

- **Open File:** Browse your computer to analyze an existing image or document.
- **Screenshot:** Manually trigger the selection panel to capture a new region of your screen.
- **Paste:** Instantly create a workspace from an image currently stored in your clipboard.
- **Workspace History:** A list of all your previous captures. You can quickly return to this list from anywhere in the app by pressing **F6**.

Managing Your History

Use the **Up and Down Arrow keys** to navigate your saved workspaces in the history list:

- **Enter / Space:** Open the selected workspace to continue your analysis.
- **F2:** Rename the selected workspace for better organization.
- **Delete:** Permanently remove the selected workspace from your history.
- **Application Key:** Open a context menu with additional options for the selected workspace.

Creating a Workspace

To start, capture your screen by pressing **Alt + Ctrl + Z** or **Alt + 1**. This opens a **selection panel dialog** that lets you choose exactly what to analyze:

- **Full Screen Capture:** Simply press **Enter** while the selection window is active to capture everything visible on your screen.
- **Region Selection:** This panel acts as a safety layer to **prevent accidental workspace creations**. While active, you can visually drag your mouse to select a specific part of the screen for analysis.

Note: If the selection window does not appear to be active, use **Alt + Tab** to find and focus it. You can disable the selection panel in **Settings > General** if you prefer direct full-screen captures.

The Workspace Experience

Once captured, you enter the workspace interface. Here is a breakdown of the available controls:

- **Offline OCR:** Extracts text from the image locally. (Note: This requires Tesseract to be installed as per [Step 3](#).)
- **AI Refine:** Processes the raw text into a structured format (headings, lists, and tables).
- **Listen / Copy:** Use these to hear the result spoken aloud or copy the text to your clipboard.
- **Result Area:** The main display where your OCR and AI results are shown.
- **Open Structured View:** Appears after using AI Refine. It opens your default web browser to show the result in a clean, accessible web layout.

- **AI Model Selection:** A dropdown to choose which configured AI model to use for the current workspace.
- **Chat History:** A list view showing your previous questions and AI answers.
- **Ask a Question & Send:** Use the edit field at the bottom to type queries and click **Send** (or press **Ctrl + Enter**) to submit your question to the AI.
- **Close Workspace:** Press **Escape** at any time to return to the home screen.

Smart Compare Workflow

Track visual changes with ease by comparing your current screen against a previously saved "baseline" image. Both actions below will open the **selection panel dialog** (unless disabled in settings) to choose the target region:

1. **Set Baseline (Alt+Ctrl+X or Alt + 2):** Capture the "starting state" of a window or region.

Once set, this baseline is saved indefinitely. You only need to set it once; any future comparisons will use this image until you decide to update it by setting a new baseline with the same shortcut. *Note: Even if the result dialog for the baseline is closed, the baseline is still saved successfully and can be used for comparison at any time.*

2. **Compare (Alt+Ctrl+C or Alt + 3):** Run the comparison against your saved baseline.

While processing, a dialog will appear showing a **Cancel** button and a **Log Box** displaying real-time progress. If the comparison is successful, focus will move directly to the **Result View**.

Navigating the Comparison Results

In the result view, you can read the **AI OCR result for the baseline** as well as the **differences between the baseline and the current screen** as plain text. Use **Tab** to navigate through the following options:

- **Close:** Exit the comparison dialog (or press **Escape**).
- **Listen / Copy:** Hear the differences spoken or copy them to your clipboard.
- **Open Structured View:** View the comparison in your web browser.
- **Open as Workspace:** This converts the comparison result into a permanent workspace. **Important:** Normal Smart Compare results are *not* saved in your history; use this option if you want to keep the record.

Note: The selection panel can be disabled in **Settings > General** if you prefer direct full-screen captures.

Real-World Use Cases

General OCR & Accessibility

Chalkboard excels at making visual information accessible. Use it to:

- **Read Inaccessible Documents:** Analyze PDFs or images that aren't tagged for screen readers.
- **Explore App Interfaces:** Understand the layout of complex applications that have unlabeled buttons or custom graphics.
- **AI-Powered Insights:** Use *AI Refine* to convert a messy list into a structured table or use *Visual Query* to ask, "What is the status shown in the top-right corner?"

Smart Compare for Dynamic Web Content

The **Smart Compare** feature (**Alt + 3**) is a powerful tool for navigating inaccessible websites or applications where visual changes occur without focus updates:

Workflow: Monitoring Form Submissions

1. **Set Baseline:** Before clicking a "Submit" or "Action" button on a potentially inaccessible form, press **Alt + 2** (or **Alt+Ctrl+X**) to capture the current state.
2. **Perform Action:** Click the button or perform the action.
3. **Compare:** Press **Alt + 3** (or **Alt+Ctrl+C**). Chalkboard will analyze the screen and report exactly what changed—such as an error message appearing in red or a "Success" dialog that the screen reader didn't automatically focus.

Workflow: Tracking Background Status

If you are waiting for a process to finish (like a file upload or a server start) that doesn't provide audio feedback, set a baseline and periodically press **Alt + 3** to hear the updated status text as it changes on screen.

Keyboard Shortcut Reference

Global Hotkeys (Work Anywhere)

Action	Shortcut
OCR Capture to Workspace	Alt + Ctrl + Z (or Alt + 1)
Set Smart Compare Baseline	Alt + Ctrl + X (or Alt + 2)
Compare with Baseline	Alt + Ctrl + C (or Alt + 3)

Inside a Workspace

Action	Shortcut
Run Offline OCR	Ctrl + R
AI Refine (Semantic HTML)	Ctrl + Shift + R
Send AI Query / Chat	Ctrl + Enter
Speak Selected Result	F5

Action	Shortcut
Stop Speech / Cancel	Escape

Settings Categories

Access settings via **Ctrl + ,**. Use **Ctrl + Tab** to switch between these pages. All changes require saving with **Alt + S** or the **Save** button to take effect. *If unsure, keep default settings. They are optimized for the best experience.*

General Settings

Manage the core behavior and feedback of the application:

- **Selection Panels:** Individually toggle whether the region selector appears before a **Workspace Capture** or a **Smart Compare**. If disabled, Chalkboard captures the full screen immediately.
- **Audio Feedback:** Toggle processing sounds that play during **AI Refine** and **Smart Compare** analysis, as well as the **Success Chime** that plays when a task completes.
- **Auto-focus:** Enable this to have the application automatically move focus to the result view immediately after a Smart Compare analysis is finished.

OCR Providers

Configure **Tesseract** for high-speed offline text extraction:

- **Language:** Select the primary language for recognition (default is English).
- **PSM (Page Segmentation Mode):** Adjust how Tesseract interprets the layout (e.g., auto-detect, single block of text, or single line).
- **OEM (Engine Mode):** Choose the underlying OCR engine version to balance recognition quality and performance.

AI Providers

Enable and configure intelligent models like **Gemini** or **OpenAI**. You must first **Enable** a provider before its settings can be modified:

Note: The **SmolVLM** provider is currently in an experimental phase and may not work on all systems. This is a known issue that will be fixed shortly.

- **API Key:** Paste your provider-specific key here. → [How to get a Gemini key](#)
- **Model Selection:** Choose specific AI models (e.g., `gemini-2.0-flash` or `gpt-4o`) depending on your needs for speed or deep reasoning.
- **Response Control:** Fine-tune the **Max Tokens** (length of response), **Timeout** (max wait time), and **Temperature** (creativity level).
- **Feature Toggles:** Choose whether the AI should be used for **OCR Refinement** (structuring text) or **Visual Queries** (answering questions about the image).

TTS Providers (Speech)

Select your preferred voice engine. **Microsoft SAPI5** and **gTTS** are completely free. SAPI5 works entirely offline, while gTTS requires an internet connection and may have a slight delay.

- **Voice Properties:** Adjust the **Rate** (speech speed) and **Volume**. For SAPI5, you can select from all installed Windows voices.
- **Auto-speak:** Toggle whether OCR results or AI answers should be read aloud automatically upon arrival.
- **Premium Voices:** Providers like Azure or ElevenLabs offer high-quality natural voices but require their own API keys.

Shortcuts (Hotkeys)

Fully rebind any application action to a new key combination:

- **Customizing:** Tab to the **Change** button for any action (the screen reader will announce the current shortcut along with this button). Click it, then press your desired keys. The dialog will close and apply the change.
- **Defaults:** Use the **Reset** button to return any specific shortcut to its original factory setting.

Appearance & Data

Customize the visual interface and manage your information:

UI/Appearance

Personalize your experience by choosing between System, Light, Dark, or High Contrast themes. You can adjust the font size and zoom factor for better visibility, and toggle visual aids like OCR confidence scores or bounding boxes. This is also where you can set the maximum number of items to keep in your workspace history.

Startup & Tray Behavior

You can set Chalkboard to launch automatically at login so it is always ready. Other options include starting the app minimized to the system tray or keeping it running in the background when the main window is closed, ensuring your global shortcuts and monitoring stay active.

Data

Manage your workspaces and settings by exporting them to a backup file or importing them onto a new computer. You also have the option to "Clear Data" to delete all saved workspaces or "Reset All Settings" to revert every configuration to its original factory default.

It is important to remember that any adjustments you make across these categories will not be applied until they are explicitly saved. To finalize your configuration, use the **Save** button located at the bottom of the settings window or press the **Alt + S** shortcut. If you wish to exit the settings without keeping any of your modifications, you can use the **Cancel** button or press the **Escape** key to discard the changes and return to the main interface.

Contributors

Chalkboard was developed by a dedicated team committed to digital accessibility:

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