TSK-Typer Functional Specification - v.1.1

Saba Saba

June 14, 2014

Contents

List of Figures

1 Overview

The touch-sensitive keyboard (TSK) is a keyboard that can detect a user's fingers resting lightly on the keys. TSK-Typer is a typing game that leverages the TSK's functionality to determine the typist's posture while using the application.

Disclaimer: This specification is not complete, and is subject to revision.

2 Non-Goals

TSK-Typer is not intended to deal with TSK's keyboard gesture functionality.

3 Scenarios

Scenarios are provided below to better understand the cases where a user would use TSK-Typer.

1. Robert is a zookeeper with aspirations of becoming a celebrated novelist. To achieve this goal, he purchases hundreds of computers. He then forces the zoo's chimpanzees to type for long hours every day. Since progress is slow, he installs TSK-Typer on each computer. Thus, he hopes to improve the chimpanzees' typing skills and subsequently gain a novel in the process.

2. Jim is a competitive video-gamer who wants to enter the big leagues. However, he finds himself looking down at his keyboard when entering keyboard commands. Furthermore, it is difficult to make out each letter with only the dim glow of the monitor illuminating the keyboard. Naturally, this prevents him from climbing up in the ranks. To gain an edge over his opponents, he installs TSK-Typer to improve his hand-eye coordination and typing speed.

4 Screen Specification

TSK-Typer features a few different screens that the user interacts with. Each screen is described below from the user's perspective.

4.1 Setup Screen

The setup screen is the initial screen displayed to the user. The text area contains the text that the user will type in the typing screen. This text area can be edited by the user manually. Alternatively, the user may choose to load the contents of a text file into the text area. This is accomplished by checking the **Show File Selection** check box, which displays a text box and a **Browse**

button. The text box displays the name of the text file that will be loaded. A **Browse** button beside the text box allows the user to bring up an open file dialog. If the text box is empty or contains an invalid file path, an error indicator is displayed next to the text box and the **Begin** button is disabled. Otherwise, the contents of the file are displayed in the text area. Once the text area is non-empty, the **Begin** button is enabled. Clicking the **Begin** button switches TSK-Typer to the typing screen.

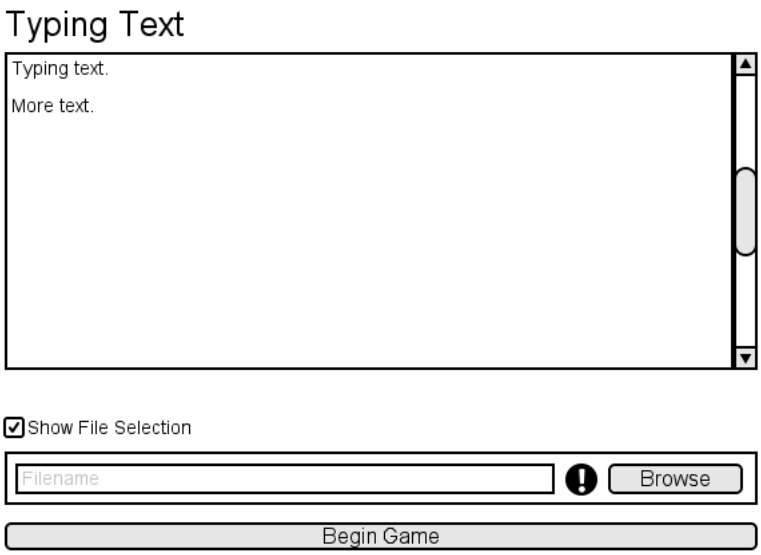


Figure 1: Setup screen with file selection displayed

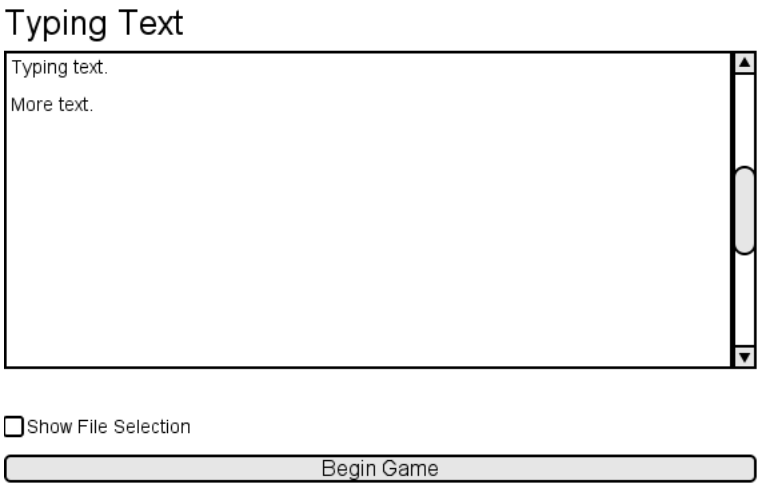


Figure 2: Setup screen with file selection hidden

4.2 Typing Screen

The typing screen deals with testing the user's typing skills using text extracted from a given text file. A subset of the text, restricted to 50 characters, is displayed in a marquee-like display. Each character, inluding whitespace, is displayed in monospace font. A caret placed underneath a character denotes the character that the user should type. When the user presses a key, the character changes colour: green signifies success, red signifies an incorrect character, and yellow signifies a correct character typed with incorrect finger placement on the TSK. Additionally, the text shifts one space to the left whilst the caret remains in the same position. To make whitespace characters easier to see, the following representation is used: a single space is represented as a blank character, a tab is represented by the word **Tab** in a box, and a newline is represented by the word **Return** in a box. Once every character in the text has been typed, TSK-Typer switches to the results screen.

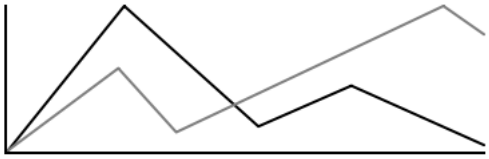
Figure 3: Typing Screen

4.3 Results Screen

The results screen displays the user's performance statistics. These statistics are displayed in a table. Additionally, a line chart visible below the table lists the number of mistakes made by the user over time. The line chart features two sets of plots: the number of incorrect characters over time, and the number of characters typed with incorrect form over time. An overall score is also displayed above the table. The formula for determining the score is given in figure 5. Note that a word is considered to be correct if and only if each character is typed correctly with proper form. A word is considered incorrect if at least one of the characters typed is incorrect. Finally, a word is considered to be typed with incorrect form if at least one of the characters has been typed with incorrect form. This screen features two buttons: the **retry** button and the **settings** button. Clicking on the **retry** button results in the TSK-Typer switching to the typing screen with the same text file loaded. Clicking on the **settings** button results in the TSK-Typer switching to the setup screen.

Score: 1420

▼ Category	▼ Score
Words Correct	50
Words incorrect	78
Words with incorrect form	120
Characters correct	578
Characters incorrect	340
Characters with incorrect form	400
Word per minute (WPM)	50



Retry Settings

Figure 4: Results Screen

Let σ represent the overall score of the user, s is the words per minute, w_g is the number of words typed correctly, c_b is the number of characters typed incorrectly, and c_f is the number of characters typed with incorrect form. Hence, the algorithm for calculating the overall score is:

$$\sigma = sw_g - (2c_b + c_f)$$

Figure 5: Score algorithm