3X3 Scoreboard System User Manual

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Abstract—**Welcome to the comprehensive guide for operating the scoreboard system. This document provides step-by-step instructions and key functionalities for managing fouls, scores, game time, shot clock, time-out indicators, and other features. Whether you're a new user or someone needing a quick refresher, this guide ensures you have everything you need to run the system smoothly. The Tehran 3X3 Scoreboard is a feature-rich digital tool for managing 3X3 basketball games. I was creating the app in collaboration with the team from the Tehran Basketball Branch to make this scoreboard tool freely accessible to everyone worldwide. This system is designed exclusively for desktop use and offers intuitive keyboard shortcuts, mouse interactions, and dynamic updates to ensure smooth game-play management. The scoreboard has been meticulously designed to align with the latest FIBA 3X3 Official Rules, ensuring compatibility with international basketball standards.**

Keywords: Basketball officiating, 3X3 Scoreboard, Referee Performance

I. FEATURES OVERVIEW

The scoreboard system is designed to provide an intuitive interface for tracking game metrics, including:

1) Game Timer Control
2) Shot Clock Management
3) Team Name Editing
4) Score Updates
5) Foul Management
6) Timeout Tracking
7) Horn Activation
8) Interactive Display

II. GAME TIMER CONTROL

The game timer starts at 10:00 by default. Operators can adjust its value or trigger special state of "OVERTIME".

A. Keyboard Controls

- Start/Stop Timer: Press the Spacebar.
- Edit Timer: Press F9. Enter the time in the format MM:SS.MS (e.g., 5:30.000) or type OVERTIME for extended play.

B. Visual Feedback

- Running State: Timer digits are white.
- Stopped State: Timer digits turn red for clarity.

III. SHOT CLOCK MANAGEMENT

The shot clock is set to 12 seconds by default and operates seamlessly with dedicated keyboard controls. When the shot clock is running and reset (using the reset command), it will automatically restart and begin counting down from 12 seconds. However, if the shot clock is stopped and reset, it will not automatically restart. The operator must manually start it again using the appropriate control.

A. Keyboard Controls

- Start Shot Clock: Press Arrow Up.
- Stop Shot Clock: Press Arrow Down.
- Reset Shot Clock:
  - If the shot clock is running, pressing Arrow Left or Arrow Right will reset it to 12 seconds and automatically restart it.
  - If the shot clock is stopped, pressing Arrow Left or Arrow Right will reset it to 12 seconds, but it will remain stopped until manually started.

IV. TEAM NAME EDITING

Team names can be customized with up to *6 characters* and assigned specific colors, including: *Red*, *Orange*, *Yellow*, *Pink*, *Blue*, *Gray*, *Green*, *Purple*, *White*. These colors ensure visibility and clarity on the scoreboard.

A. Keyboard Controls

- Edit Team 1 Name: Press F2.
- Edit Team 2 Name: Press F4.

1) Steps:

- Input the new name in the format: NAME:COLOR (e.g., SHARIF:blue).
- Allowed Colors: red, orange, yellow, pink, blue, grey, green, purple, white.

2) Restrictions:

- Maximum of 6 characters for team names.
- Invalid colors are rejected with an alert.

V. SCORE UPDATES

Scores are capped at 23 points and dynamically update with animation for visual clarity.

1) Keyboard Controls:

- Team 1 Score:
  - Increment: Press Q or q.
  - Decrement: Press A or a.
- Team 2 Score:
  - Increment: Press P or p.
  - Decrement: Press L or l.

2) Mouse Controls:

- Buttons near the score display allow for score updates

3) +2, +1, -1 Buttons: Score Adjustment: The buttons +2, +1, and -1 located near the score display are used to quickly update each team's score during the game:

- +2 Button: Adds 2 points to the team's score. Use this when a successful two-point shot is made.
- +1 Button: Adds 1 point to the team's score. This is typically used for free throws or one-point field goals, as per FIBA 3X3 rules.
- -1 Button: Subtracts 1 point from the team's score. Use this to correct scoring errors or if a point needs to be deducted due to a penalty or mistake.

4) Usage Notes:

- Score Range: Scores are capped between 0 and 23 to prevent invalid inputs.
- Live Update: The scoreboard reflects score changes immediately, providing a seamless visual update for viewers.
- Team-Specific: Each team's buttons are positioned near their respective score displays for ease of access. This setup allows operators to quickly and accurately manage score adjustments in line with the game's flow.

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VI. Foul Management

Each team has a dedicated foul count display located beneath their score on the scoreboard. This section helps track team fouls throughout the game, which is critical for enforcing FIBA 3X3 rules.

1) Keyboard Controls:

- Team 1 Fouls:
  - Increment: Press W.
  - Decrement: Press S.
- Team 2 Fouls:
  - Increment: Press O.
  - Decrement: Press K.

2) Mouse Controls:

- Buttons near the foul count allow for manual updates.

VII. Timeout Tracking

1) Mouse Interaction: Timeouts are managed with a countdown timer. Once a timeout is completed, the corresponding indicator turns green.

1) Activate Timeout:
   - Click the grey button.
   - A 30-second timer appears.

2) Completion:
   - Timer disappears, and the button turns green.
3) Timer Color:
   - Timer count digits are displayed in red.

VIII. Horn Activation

The horn can be triggered for announcements or end-game signals. Keyboard Controls:

1) Press H to activate the horn.
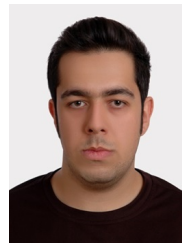2) Release H to stop it.

IX. Additional Tips

- Avoid pressing multiple keys simultaneously to prevent system conflicts.
- Familiarize yourself with the visual layout for quicker operation.

X. Acknowledgments

XI. Contact Information

For any inquiries or further assistance, please do not hesitate to contact me at my email.

I completed my Master's degree in Computer Networks from Sharif University of Technology, Iran. My interests encompass the interdisciplinary aspects of Artificial Intelligence, with a focus on Generative AI, Natural Language Processing, Deep Learning, and Machine Learning. Furthermore, I am passionate about applying Blockchain and Complex Networks principles to various academic fields, including medical analysis, sports analytics, behavioral analysis, social networks, and industrial analysis.

Alongside my technical expertise, I have a deep passion for basketball. As a basketball referee, I have firsthand experience with the challenges of officiating. This insight, combined with my technical skills, inspired me to design and develop the FIBA 3X3 Scoreboard application. My goal was to create an innovative solution that enhances referee decision accuracy and improves overall game officiation. This scoreboard is designed in alignment with the latest FIBA 3X3 Official Rules, ensuring that teams, referees, and organizers have access to a professional, user-friendly tool to improve the sports quality and integrity. My ultimate objective is to make this scoreboard freely accessible to everyone, reflecting my dedication to the global basketball community.