CHESSMATE

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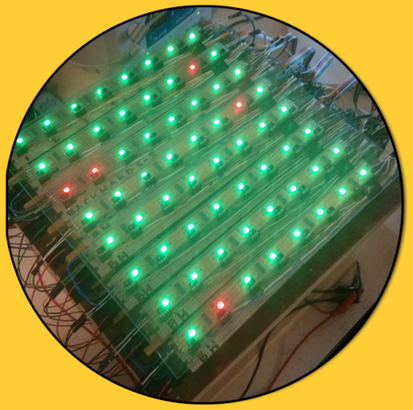
The Purpose

ChessMate was designed to assist novice chess players in learning the game, while providing players of all skill levels with a visual representation of their valid moves.

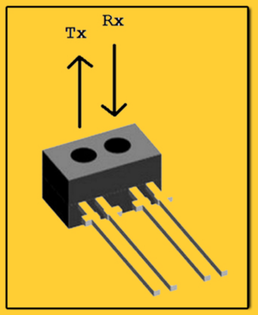
When a player lifts a piece from the board, ChessMate computes all of the possible moves that it can make based on the current state of the game. The moves are then displayed on the game-surface using LEDs.

The Design

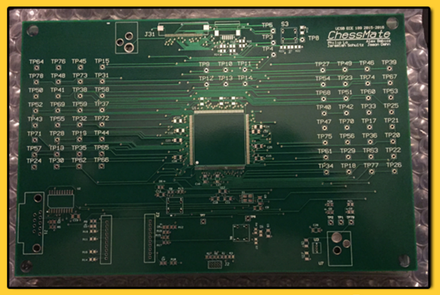


The board enclosure houses an IR sensor beneath each game tile. A digital LED lays beneath each sensor, illuminating the playing surface where desired. The sensors & LEDs communicate with the PCB, which sits at the very bottom of the enclosure.

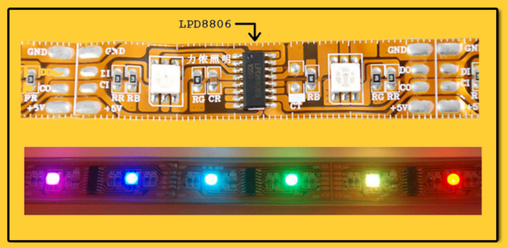
How It Works



Vishay TCRT1010 proximity infrared sensors are used to detect physical piece movement, which is used in computing valid moves & tracking the game's state.



The processor uses an array-based implementation to store the position of each piece. The move-generation algorithm for each piece determines which LEDs will be driven and illuminated on the chess board.



A digital RGB-LED strip is driven via the on-board SSP interface, in order to illuminate the valid moves each player can make for a specific piece they have chosen. Blue and green lights are used to represent player-specific moves, while red is displayed beneath a piece that can be taken.

UCSB ECE189 2015-2016