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I made a lot of progress on the UI this week. I implemented support for video files as an input for the algorithm, and added buttons to play/pause the video, go to the previous frame, and go to the next frame when paused. The way I was displaying each input source also changed. Originally, I had different methods all altering the display. For example, when the user selected an image, there would be an image method that changed the Tkinter image label, but when they picked live video as their input source, a new thread would be started that changed the image label. However, I found this to be quite problematic, since there were occasions where multiple methods attempted to change the display simultaneously. To resolve this issue, I reworked the display to be managed by a single thread that would constantly update the image label to display whatever the current frame was. Each input source would then pass frames to the thread, and the thread would be able to handle simultaneous changes.

Additionally, I added code to load the required models in a separate thread, so the user can load up their input while the models are loading. I’m currently working on adding some sort of cue that tells the user whether the models are currently loading or not.

As for the backend of the program, Kevin Fu discovered that my code had a typo in it that caused the CLAHE algorithm to not be used at all. After fixing the error, line detection is much better on images of different exposure levels, thus making board detection much more reliable. He is currently reworking piece detection to try and improve accuracy, and once that is finished, I will hook up the whole process to the UI. To display the predicted board after the whole process is complete, I am using [www.jinchess.com](http://www.jinchess.com) to query graphical chess diagrams.

