ChessBaxter

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Was the goal of the project clear from the video?

Detect the state of the chessboard and output the next move

How to do that?

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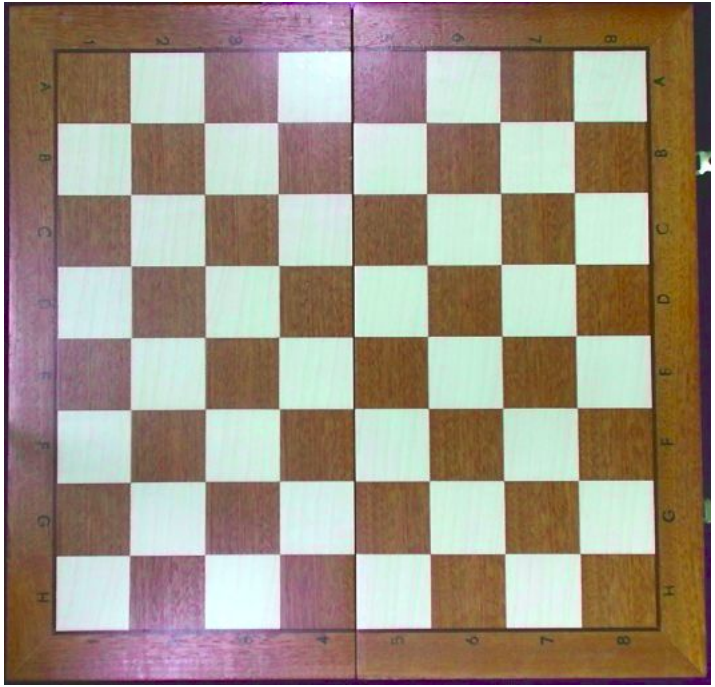
Detect the state of the chessboard and output the next move

How to do that?

1. **Detect the chessboard in an image**
2. **Detect the pieces that sit on it**
3. **Pass the state of the chessboard to a chess engine for the next move**

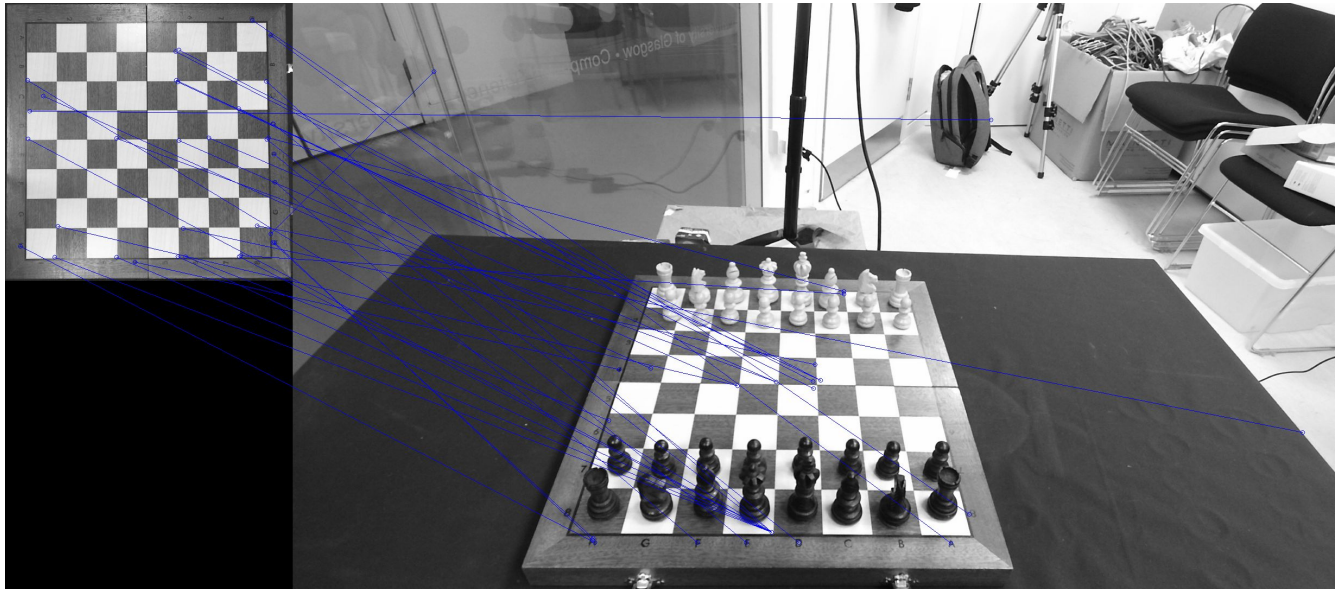
1- Detect the chessboard in an image

Feature matching (SIFT)



1- Detect the chessboard in an image

Feature matching (SIFT)

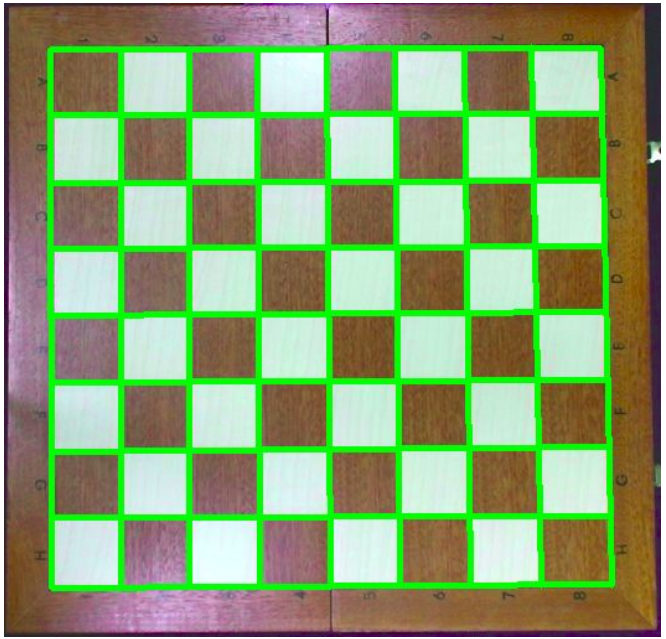


1- Detect the chessboard in an image

Homography

1- Detect the chessboard in an image

Segmentation



1- Detect the chessboard in an image

Segmentation

2- Detect the state of the chessboard

Sliding window

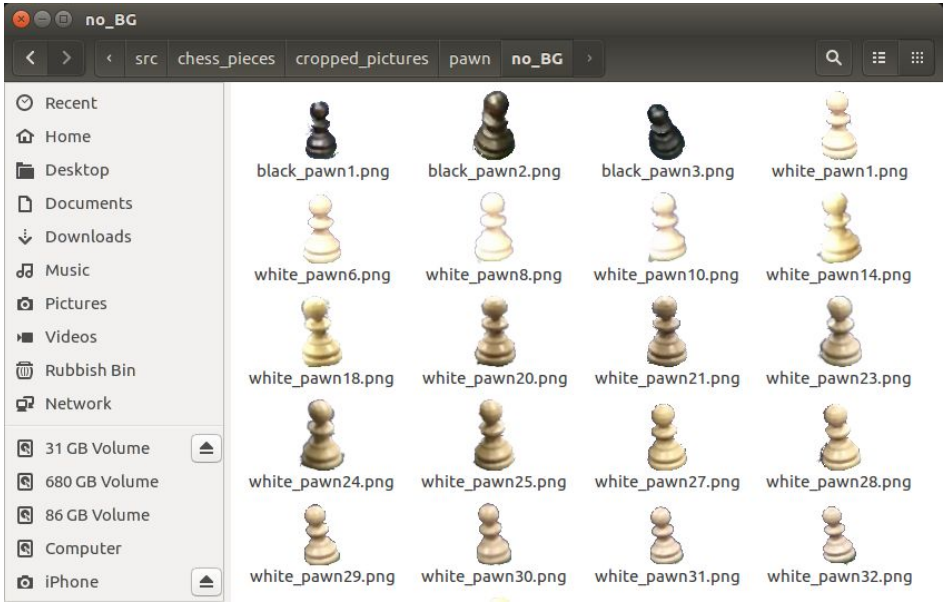
2- Detect the state of the chessboard

Piece classification

Training data:

Total = 260 samples for now

(later 1070 in the whole training set)



2- Detect the state of the chessboard

Piece classification

Features	Classifiers
SIFT	Support Vector Machine
ORB	Logistic Regression
HOG	K-Nearest Neighbours

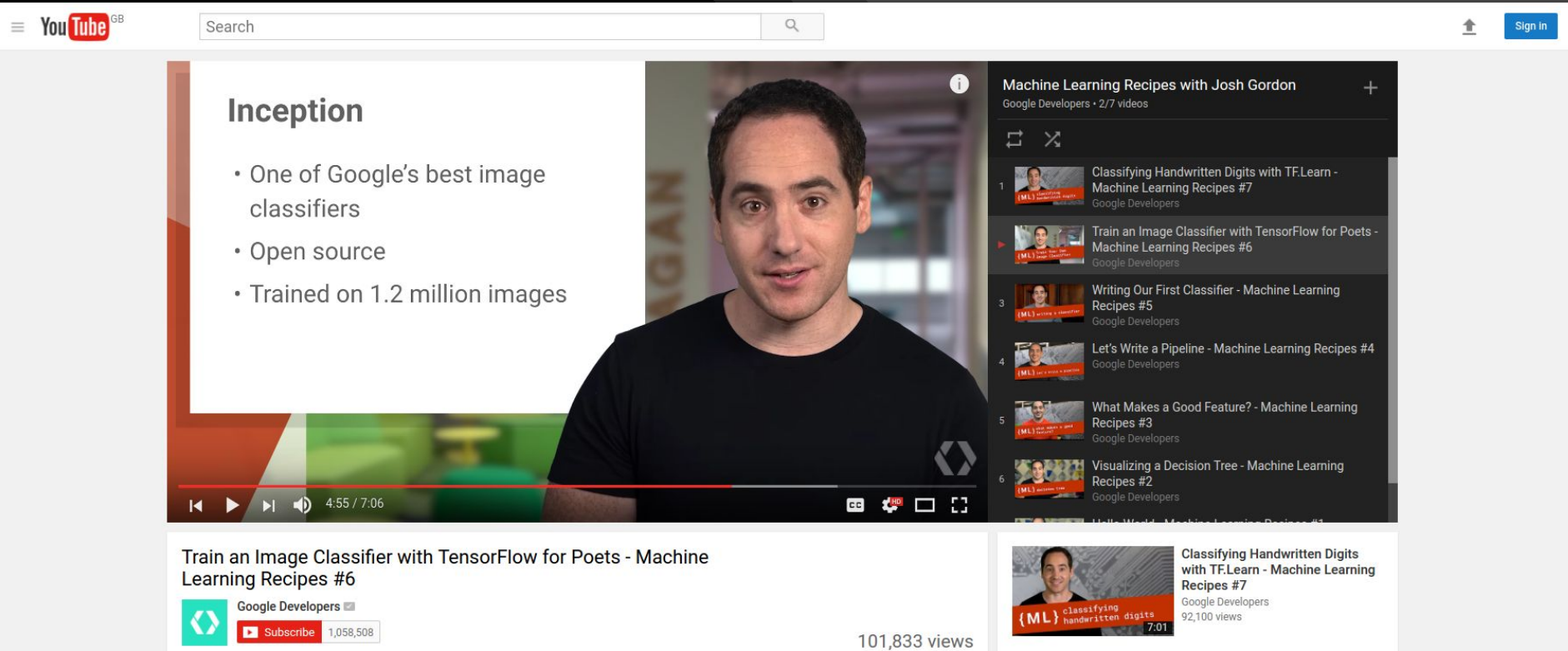
… And many others …

2- Detect the state of the chessboard

Everything was going pretty bad until...


CELSIUS

2- Detect the state of the chessboard



2- Detect the state of the chessboard

Finally good results!

Prediction

king (score = 0.72568)
pawn (score = 0.16083)
queen (score = 0.08605)
bishop (score = 0.02181)
rook (score = 0.00539)
knight (score = 0.00024)

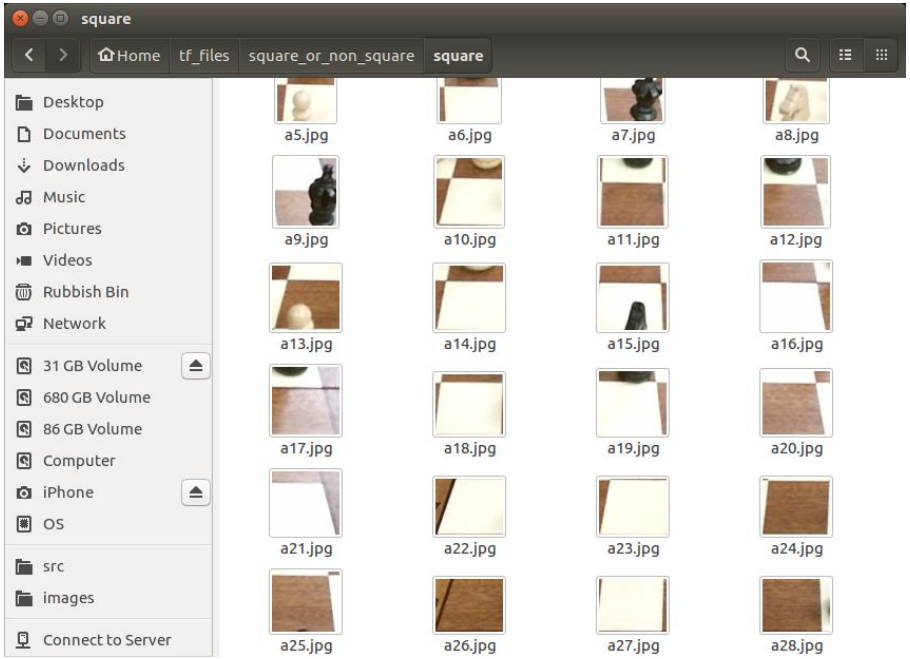
2- Detect the state of the chessboard

What now?

-> Empty square classifier

Colour classifier

Classify each square and convert to FEN notation



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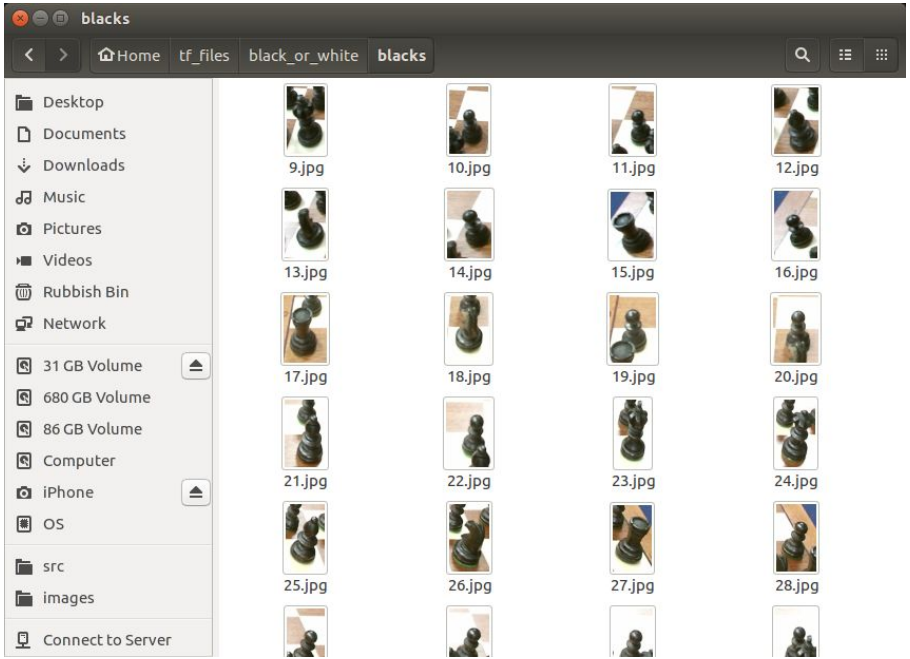

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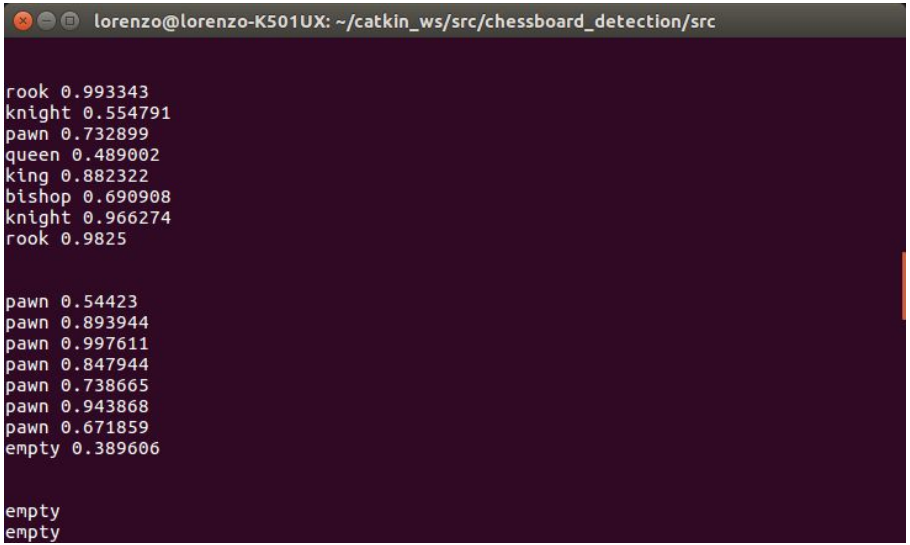
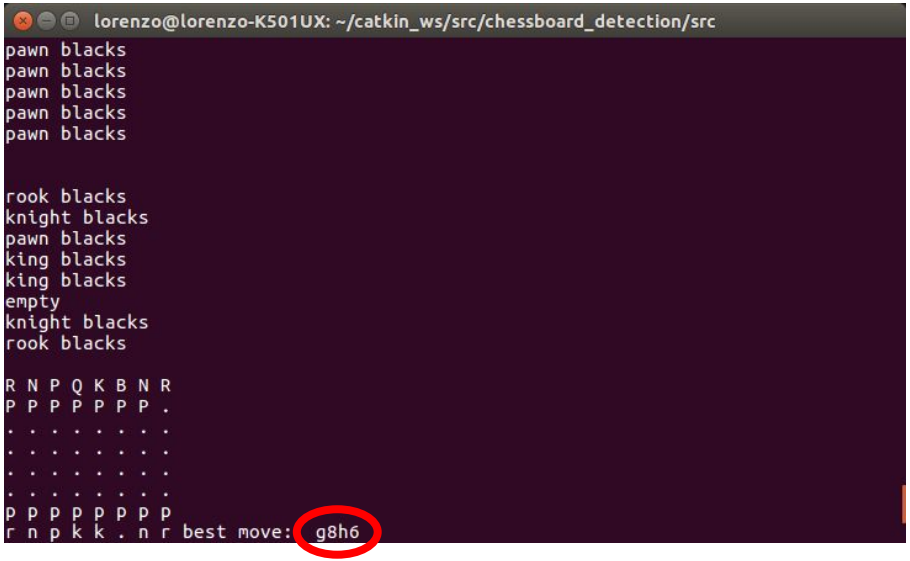


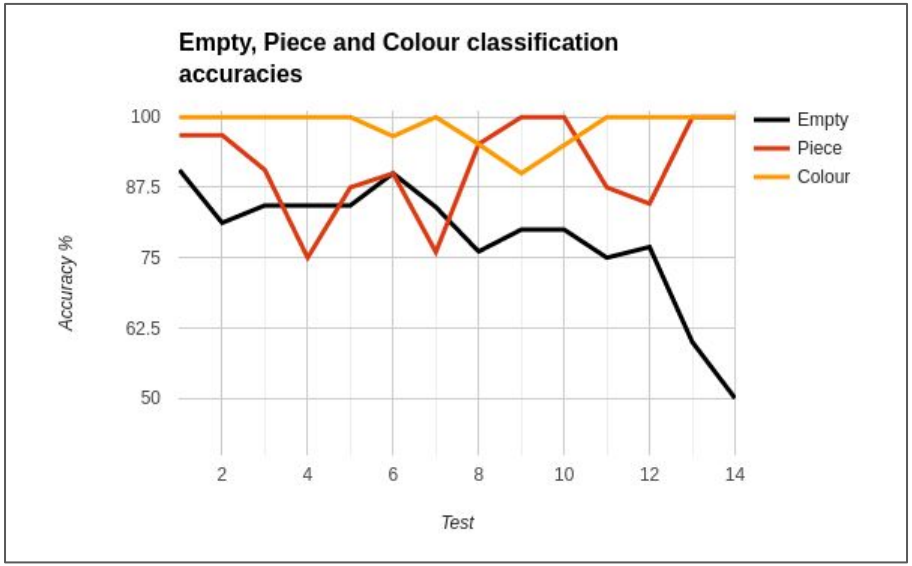
rnbqkbnr/pppppppp/8/8/8/8/PPPPPPPP/RNBQKBNR w KQkq - 0 0

3- Output the next move

Finally, pass the state of the chessboard to the chess engine and output the next move



Evaluation



Empty	78.33
Piece	91.42
Colour	98.34

Thank you

Any questions?