



Chess Piece Classifier

An AI image classifier for the six chess pieces

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The Problem

- The system looks at a photo of a single chess piece and decides which of the six types it is.
- Fixed rules are hard to write: pieces differ mainly by the shape of the top, and sets vary in colour, size, material and style.
- So the model learns those shapes from example photos, and a seventh 'neither' label lets it reject anything that is not a chess piece.

Tool: Edge Impulse



- A browser-based platform for building image models with no coding.
- I chose it because I can upload my own dataset and train in the browser.
- It exports the trained model as WebAssembly, which I host on my own web page.

The Data



- *Dataset source and licence:* _____
- Seven labels: bishop, king, knight, pawn, queen, rook, and neither.
- Cleaned out blurry and duplicate images, then split 80/20 into training and test data.

How It Works



The image is resized to 105x105, the model reads all 11,025 pixels, and returns the most likely piece.

Training and Testing



- The model was trained on the training images.
- It was then tested on separate images it had never seen.
- Test accuracy: 76%
- Testing on unseen data proves it learned shapes, not just memorised photos.

Improving the Model



BEFORE

- Confused pieces with similar outlines
- e.g. bishop vs pawn, queen vs king

AFTER

- Added photos of different sets and angles
- Retrained the model
- Higher confidence on the same hard pieces

Test → find failures → add examples → retrain → compare.



Ethics and Users

- Privacy: inference runs locally in the browser through WebAssembly, so no photo is uploaded.
- Limitation: it reads one piece at a time and cannot interpret a whole board.
- Bias: trained mostly on one style of set, so themed or unusual sets may be misread; the fix is more sets in the data.



Reflection

- Hardest part: telling apart pieces whose outlines are close, especially bishop and pawn.
- What I learned: the 'neither' class matters as much as the six real ones - without it every photo is forced to be a piece.
- Next improvement: photograph more sets in different materials and lighting.