



# Sports Ball Identifier

An AI image classifier for five kinds of sports ball

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# The Problem

- The system looks at a photo of a ball and decides which of five sports it belongs to.
- Fixed rules are hard to write: several balls share a shape, and colour and pattern change with the brand, the lighting and how worn the ball is.
- So the model learns the combination of shape, texture and pattern from example photos instead.



# Tool: Edge Impulse

- A browser-based platform for building image models with no coding.
- I chose it because I can upload my own dataset rather than use its samples.
- It exports to WebAssembly, which I host as a static page on my own site.



# The Data

- Dataset: [kaggle.com/datasets/samuelcortinhas/sports-balls-multiclass-image-classification](https://kaggle.com/datasets/samuelcortinhas/sports-balls-multiclass-image-classification) — licence CC0 1.0 Public Domain.
- Five labels: basketball, football, cricket ball, bowling ball and American football.
- Cleaned out images showing more than one ball, then split 80/20 into training and test data.



# How It Works





# Training and Testing

- The model was trained on the training images.
- It was then tested on separate images it had never seen.
- Test accuracy: 85%
- Testing on unseen data proves it learned patterns, not just memorised.



# Improving the Model

## BEFORE

- Failed or low confidence on hard images
- Eg. Colors/shape similar to other balls

## AFTER

- Added more varied training examples
- Retrained the model
- Higher confidence on the same hard images

*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: five labels and no 'neither' class, so any photo is forced to be one of the five balls.
- Bias: the dataset was collected by someone else and leans to clean, professional equipment; worn school balls score worse until I add my own photos.



# Reflection

- Hardest part: the balls that share a shape - a dark football against a bowling ball.
- What I learned: with five classes, 85% is strong - but the score hides that a photo of no ball at all still gets a confident answer.
- Next improvement: add a 'neither' class and photograph real, worn school equipment.