Local image filters and learned classification — review sheet

Use this after attempting the worked examples and practice. Explain each claim in words before calculating.

Key ideas

- A local filter map is different from an image label.
- Weight sharing reuses a local rule; pooling deliberately loses location information.
- This demonstration fits class centers, not convolutional filters.
- Report held-out results and predeclared failures with the scope of the generator.

Common errors and repairs

A fixed-filter demo trained a CNN. Only its output class centers were fitted; convolutional weights stayed fixed.

Perfect synthetic accuracy proves medical usefulness. It describes a simple same-generator test, not clinical evidence.

Every image augmentation preserves the label. Check the target: rotating wide/tall images swaps their labels.

Retrieve without your notes

- What is the valid output size for 16 by 16 input and a 3 by 3 stride 1 filter?
- What does a constant image produce under a zero-sum directional filter?
- When is the course project due?

Readiness check

- Compute one local filter response and distinguish it from a class label.
- Explain weight sharing, a nonlinearity and pooling using a small image.
- State which parts of this demonstration are fixed and which are fitted.
- Evaluate new synthetic images and explain a contrast-related failure.
- Present a bounded evidence chain for an existing course project.