

Deep feature and handcrafted feature - A combination for Material Classification

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brick

leaves

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Introduction

What is it?

Answer the question "Which material is this object made of?".

Why do we need it?

Material is a valuable information for computer to understand and interact with the world.



Which bottle should we use to store hot water?



Auto-car: "Sorry. I don't know it is water".

Only one single image for guessing material - really challenge. **Event for human!**

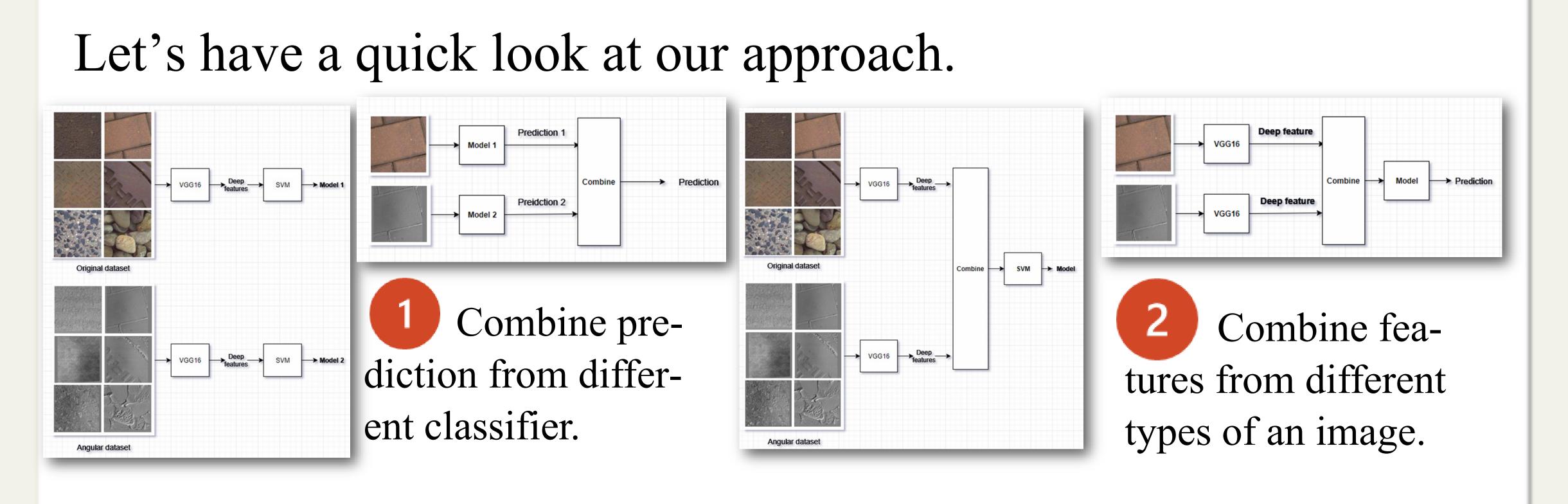


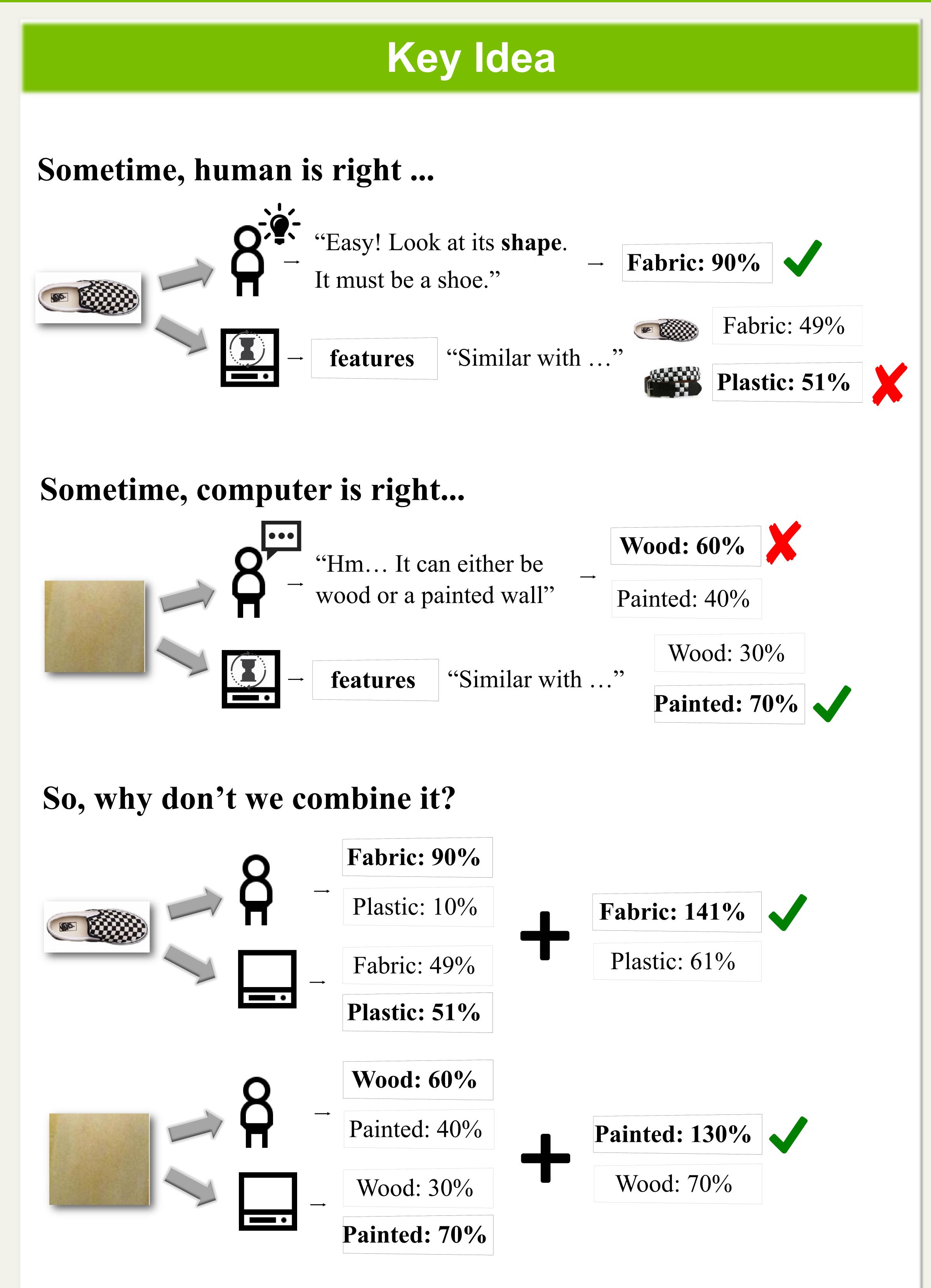
Cool! Look similar texture but it is not too hard.



Now. Can use guess which material are they?

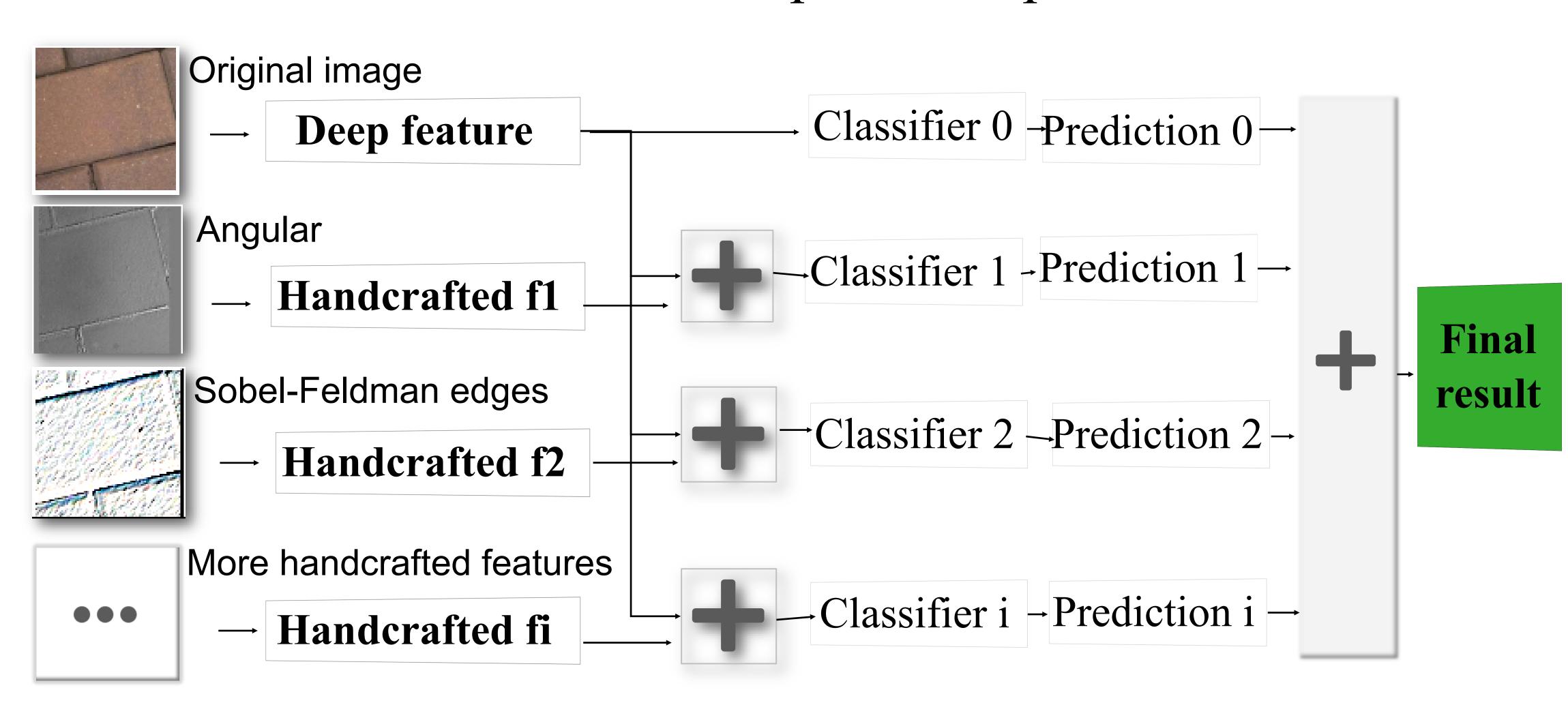
Approach





How it works

We consider that deep feature extracted from a CNN can represent for the way human think and learn. Combine it with a suitable handcrafted feature would improve the prediction.



Note: "suitable" means the feature we choose represent for information we use to classify images.

Ex. I can recognize type of material base on its shape so I choose angular and edges as additional information.

Results

