

Introducing...

OpenVisionCapsules



Open source (BSD licensed) machine
learning and computer vision encapsulation
system

OpenVisionCapsules maintainer
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1/7/2020

What is OpenVisionCapsules?

Format for **encapsulating vision algorithms**



`detector_vehicle.cap`

Format for **representing analysis results**



`detector_vehicle.cap`



`recognizer_make_model.cap`



Application

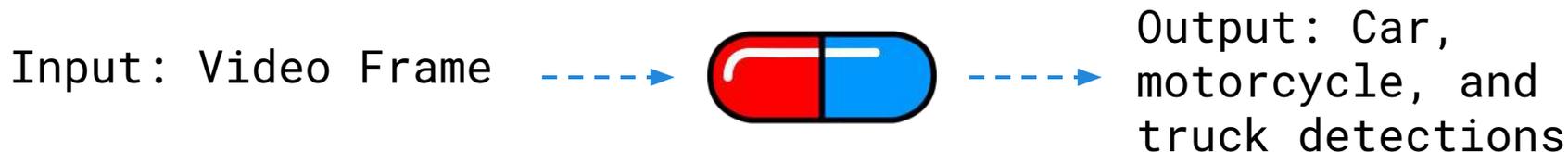
Tools for **encapsulating your algorithm**





What is OpenVisionCapsules?

Capsules are self-describing, single-file algorithm packages



Name: "detector_vehicle"

Version: 1

Description: "Finds vehicles in video"

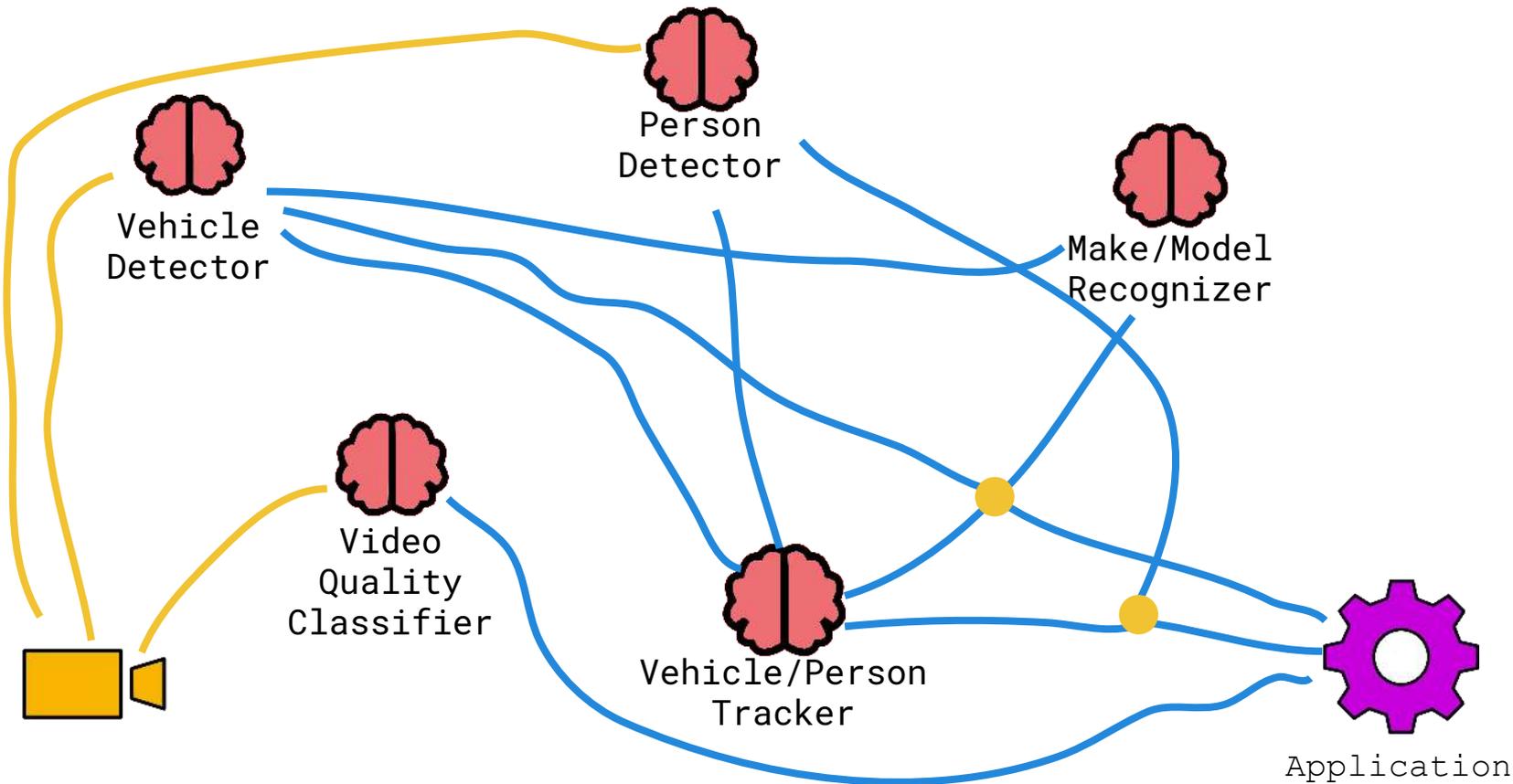


Why is this important?

“Using the framework of technical debt, we note that it is remarkably easy to incur massive ongoing maintenance costs at the system level when applying machine learning.”

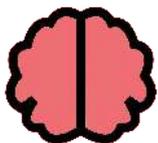
- Machine Learning: The High Interest Credit Card of Technical Debt

Why is this important?

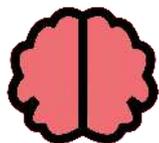


Why is this important?

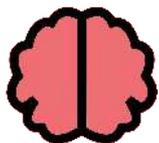
Algorithm developers want to write this:



Vehicle
Detector



Person
Detector



Video
Quality
Classifier



Vehicle/
Person
Tracker

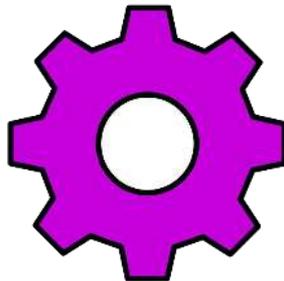


Make/Model
Recognizer



Why is this important?

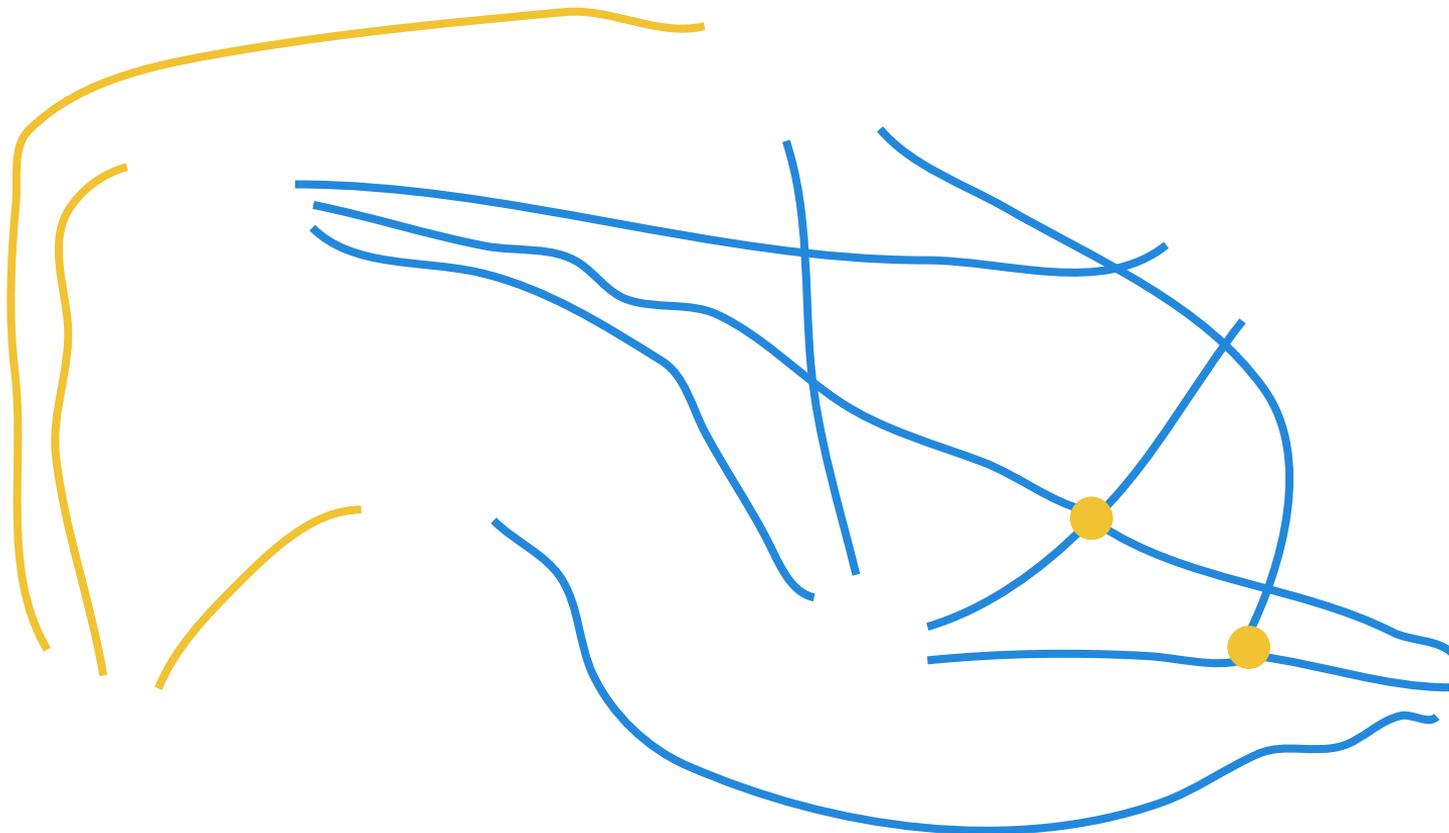
Application developers want to write this:



Application

Why is this important?

Nobody wants to write this:



The solution!

Algorithm developers write this:



detector_vehicle
.cap



detector_person
.cap



classifier_video_
quality.cap



tracker_person_
vehicle.cap



recognizer_make_
model.cap

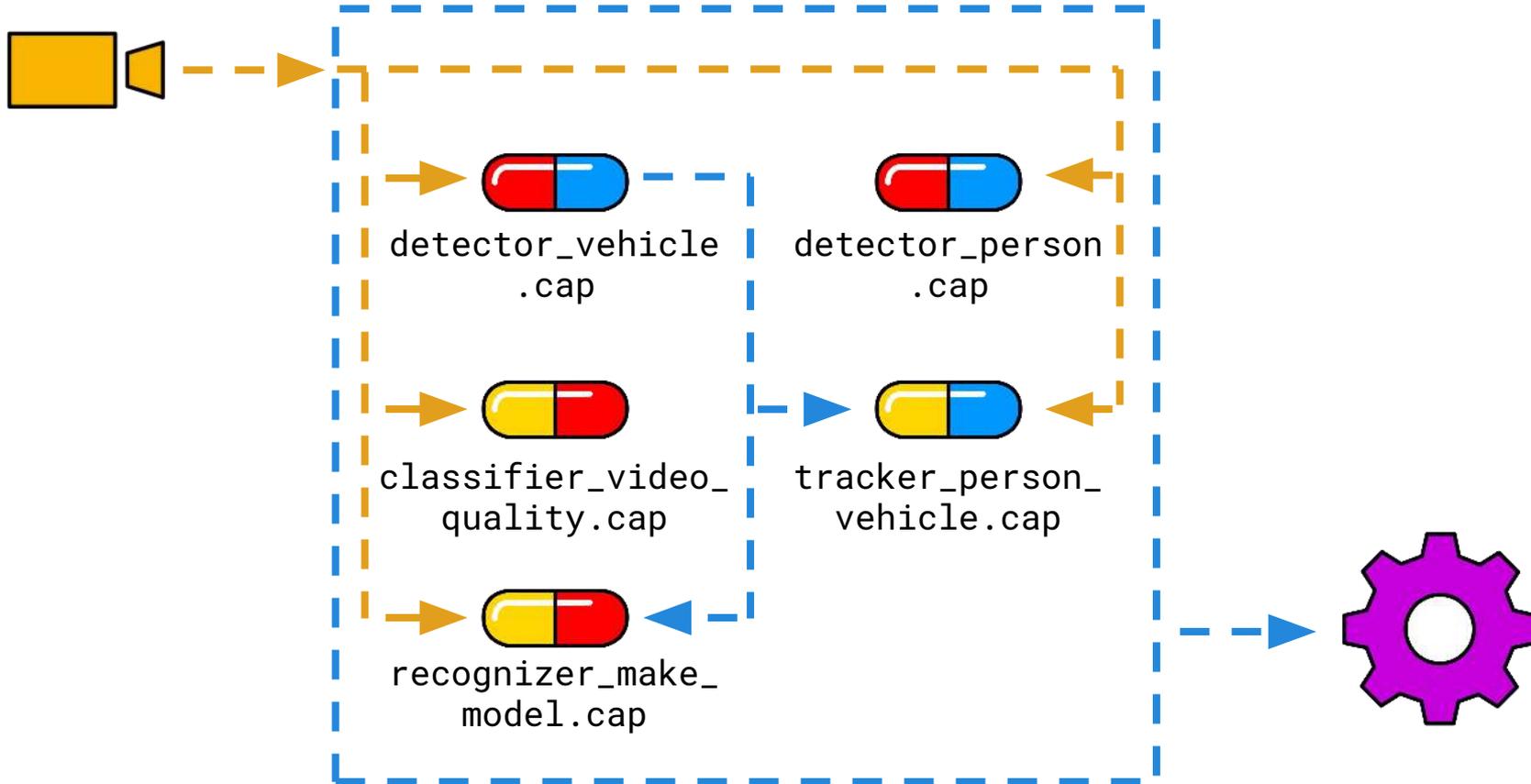
The solution!

Application developers write this:



The solution!

OpenVisionCapsules hooks it all up:





Support for OpenVisionCapsules

Available now as a developer preview!

github.com/opencv/open_vision_capsules

- BrainFrame will support OpenVisionCapsules starting January 16th
- The OpenCV Hardware Partnership will work with hardware providers to add support for OpenVisionCapsules
- Consider using OpenVisionCapsules in your computer vision project!

Available now as a developer preview!

github.com/opencv/open_vision_capsules



Q & A



OpenVisionCapsules Format

A portable format for all others, e.g. Tensorflow, Torch, ONNX, etc.

Items		Existing Model Formats: Tensorflow - .pb/.meta/.pbtxt, .tflite Keras - .h5, .keras Caffe - .caffemodel, .prototxt Torch - .pt, .pth, t7 ONNX - .onnx	OpenVisionCapsules Format .cap (Portable format for all others)
	Design goal	DNN training	DNN deployment: Self-contained, Executable
DNN model Computing	AI computing target support: CPU, GPU, or other AI chip	✓	✓
	Batch-deploy DNN models onto multiple computing targets	X	✓
	Separately batchable inference from parallelizable operations	X	✓
Self-contained DNN model & processing information	DNN weights & model in a single file	X / ✓ Separate files in most formats	✓
	Executable logic for pre/post processing	X	✓
	Expose standardized APIs for runtime algorithm configuration	X	✓
DNN Model Interconnect, Compatibility	Describes the interconnection to other DNN models	X	✓
	Compatible with other formats	X	✓