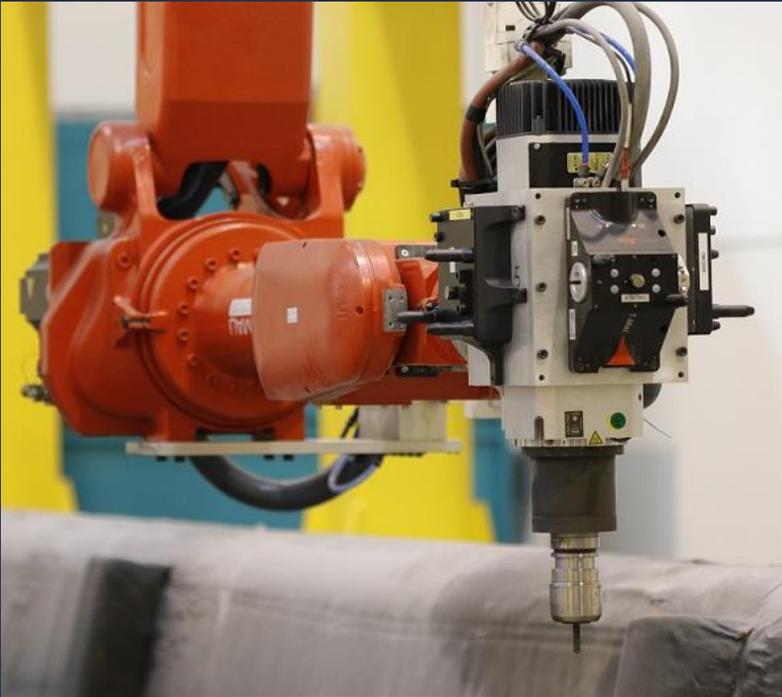


Deep Learning, Neural Networks into Production

Philipp Schmid





Robotics



Vision



Control

DEEP LEARNING

- :: 10+ years experience
- :: Support humans
- :: Industry proven

DEEP LEARNING FOR INDUSTRY

:: CSEM 2008

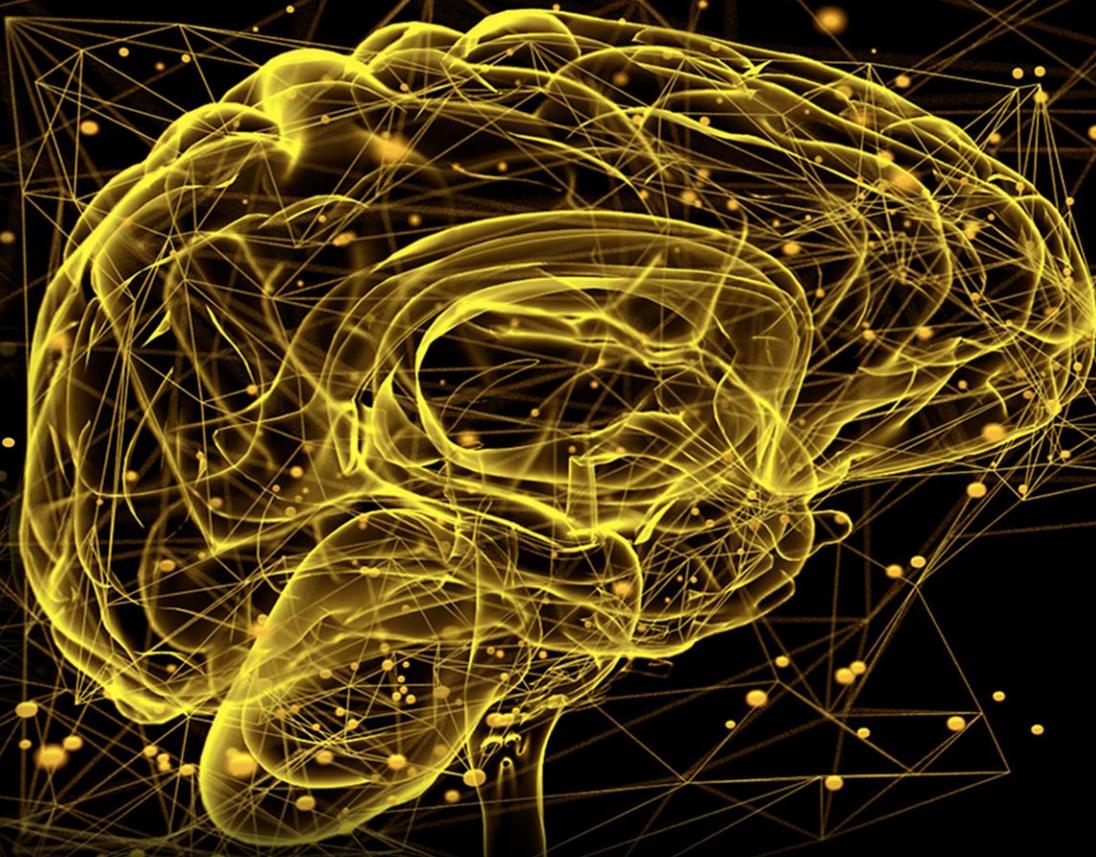
:: ViDi 2012

:: Cognex 2017



ViDi

COGNEX



Cognex VisionPro ViDi - Video

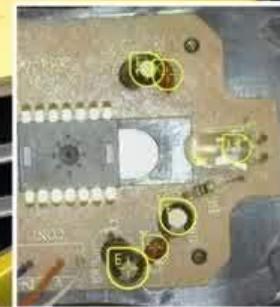
COGNEX VIDI SUITE DEEP LEARNING-BASED SOFTWARE Artificial Intelligence for Automotive Manufacturing



DEFECT DETECTION



CLASSIFICATION



ASSEMBLY VERIFICATION



CODE IDENTIFICATION

Adaptive Vision
intuitive • powerful • adaptable

Ready to use
Deep Learning tools
for industrial quality inspection

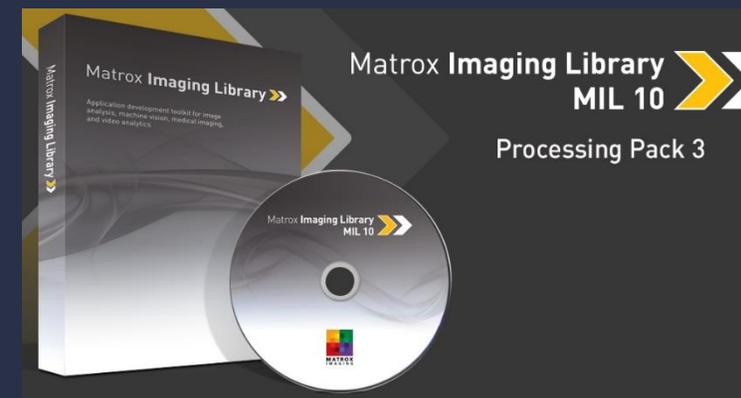
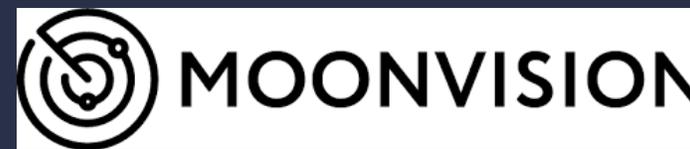
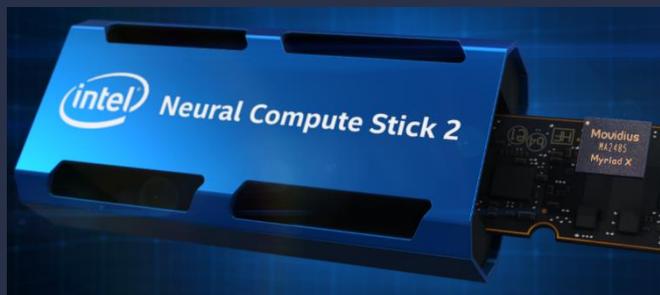


www.adaptive-vision.com

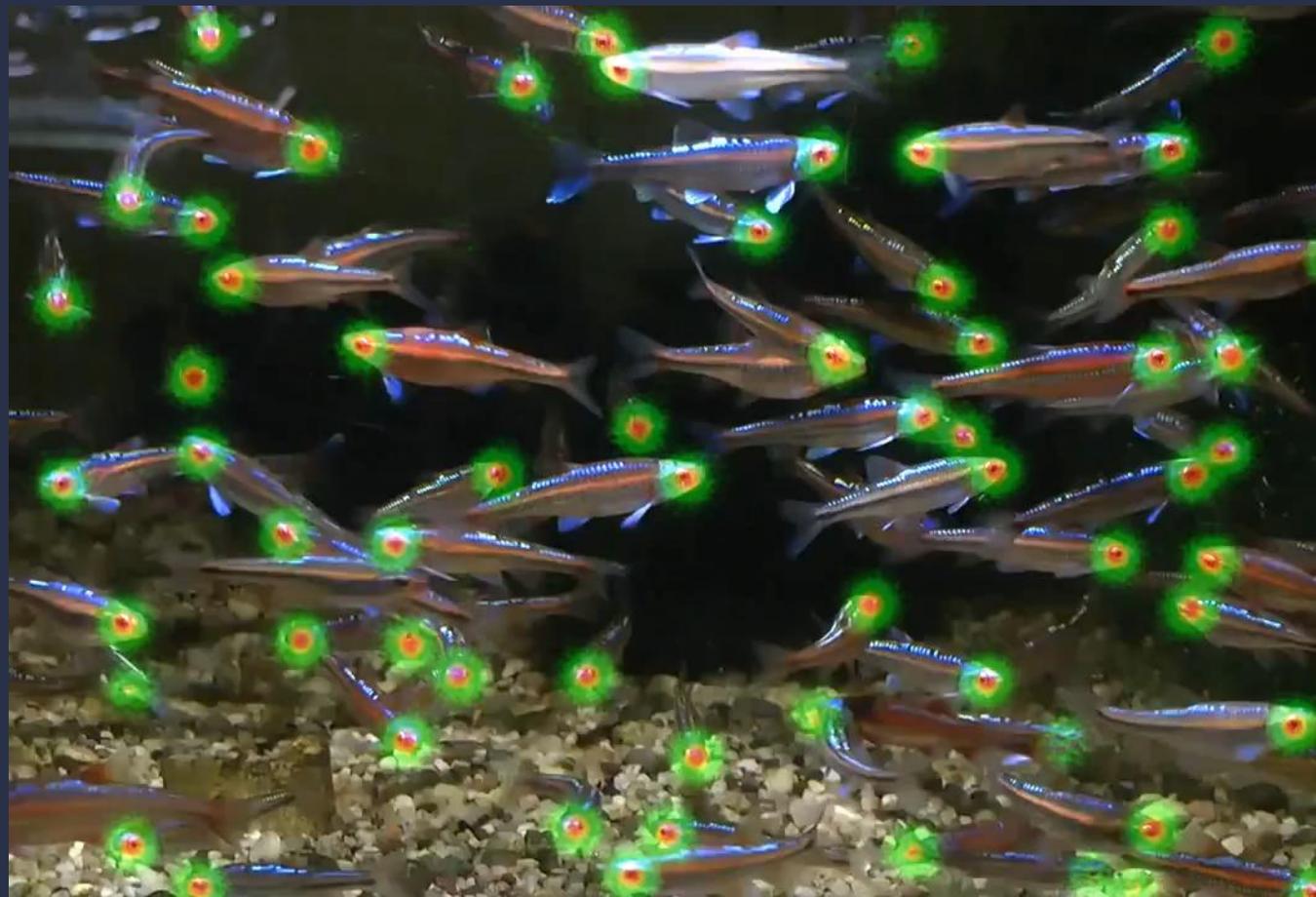


cyth
systems

NEURAL VISION



Wow Effect is easy – but...



An iceberg floating in the ocean. The tip of the iceberg is above the water line, and the much larger, jagged base is submerged below. The sky is blue with some clouds, and the water is a deep blue. The text is overlaid on the right side of the image.

Neural Network

Data Pre-, Post-Processing

Expert Knowledge

Certification

IP-Protection

Deployment

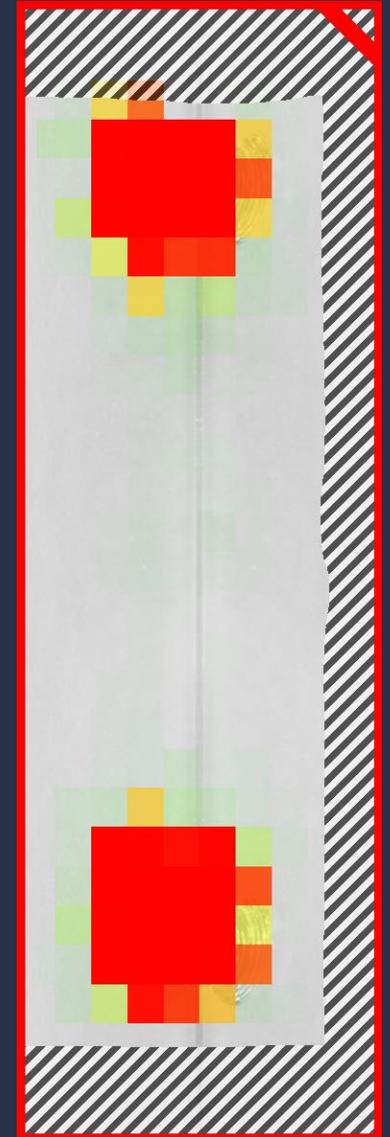
Data Management

Data acquisition

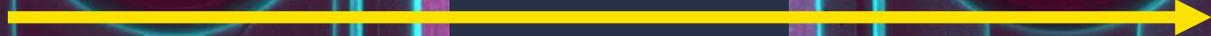
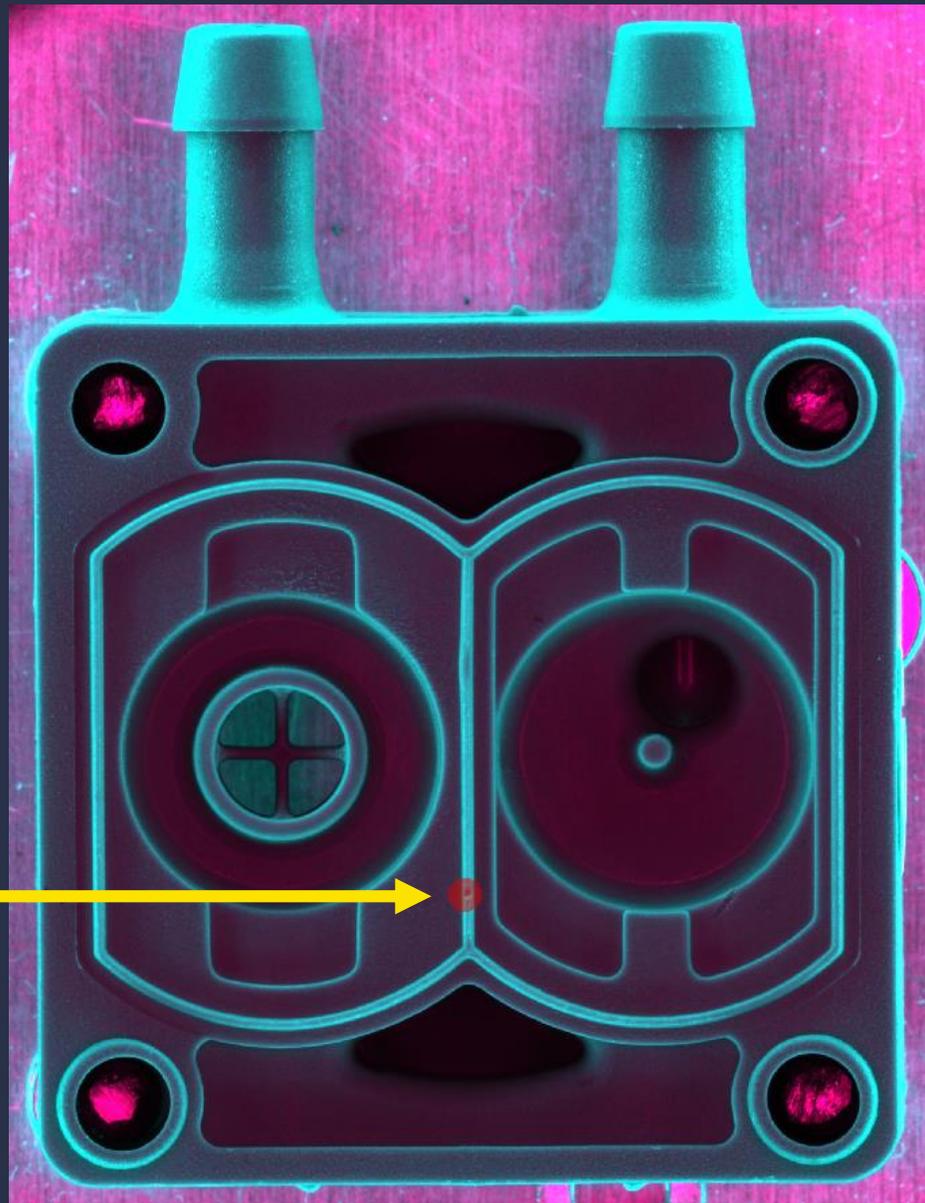
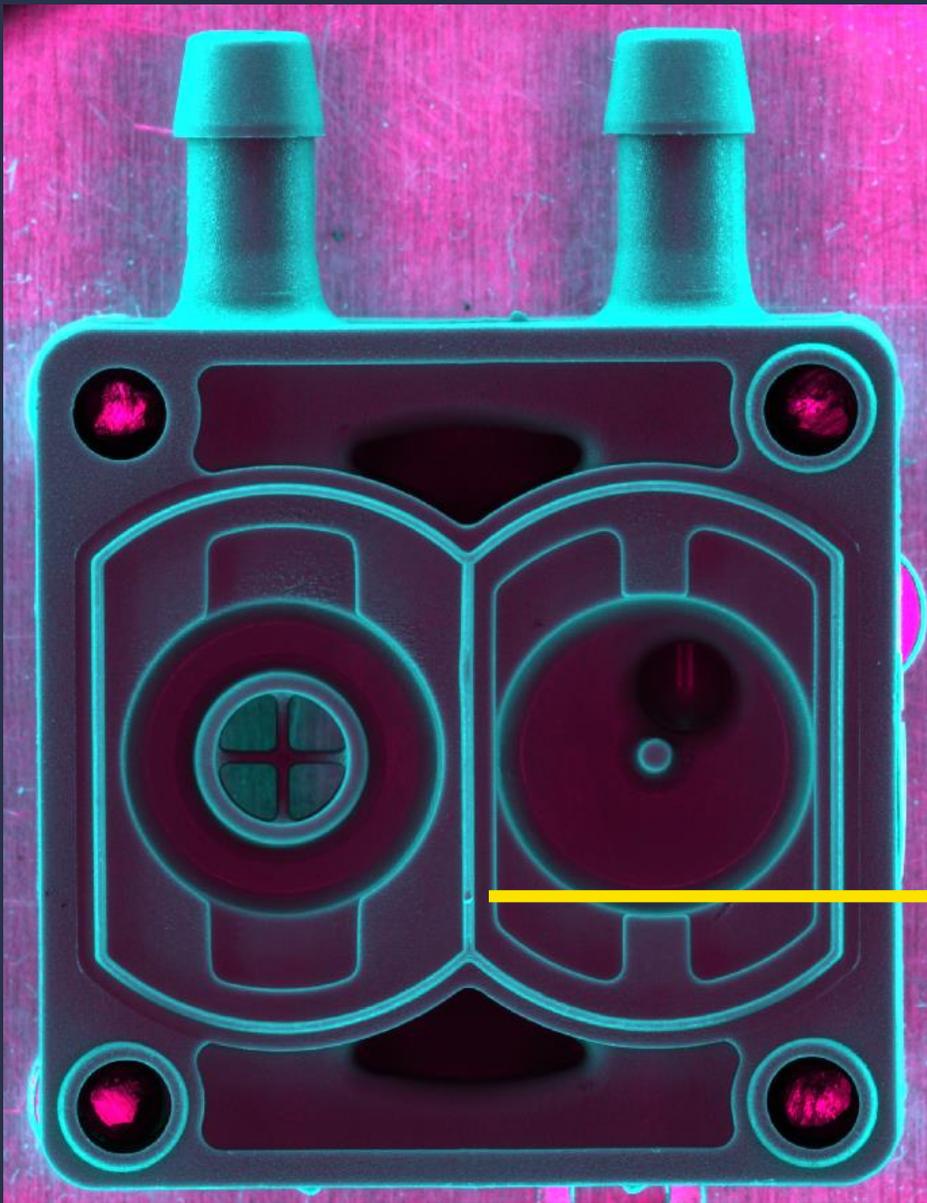
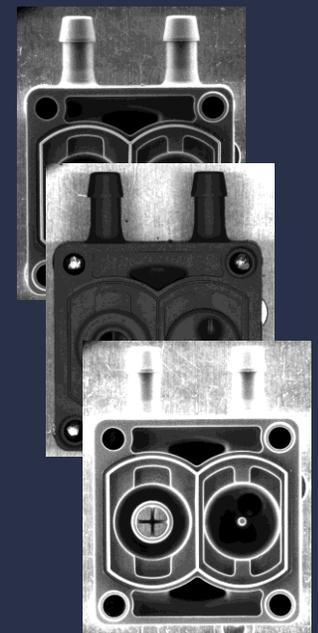
Deep Inside Knowledge is required



Accuracy: 84%



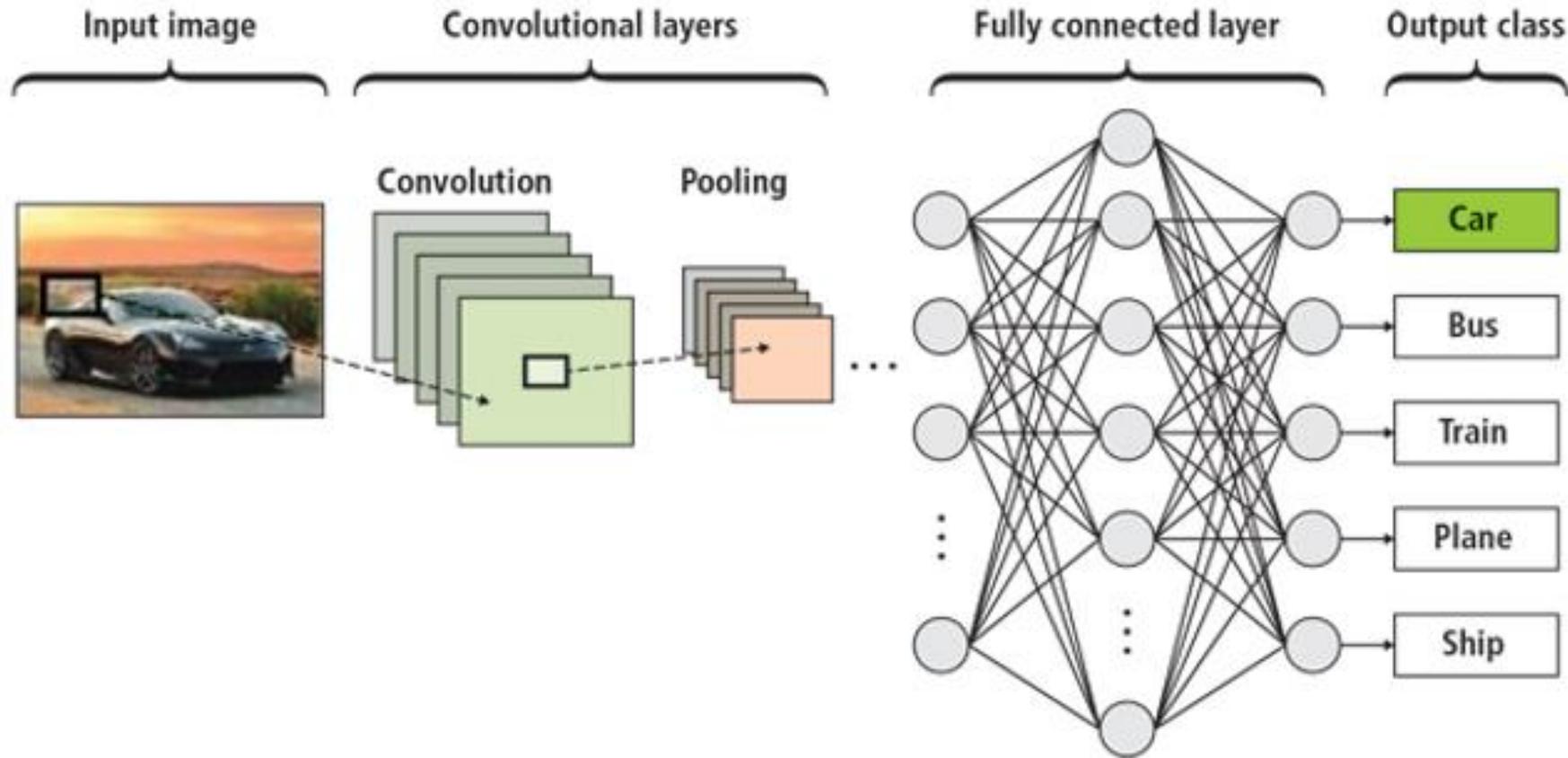
Accuracy: 96%



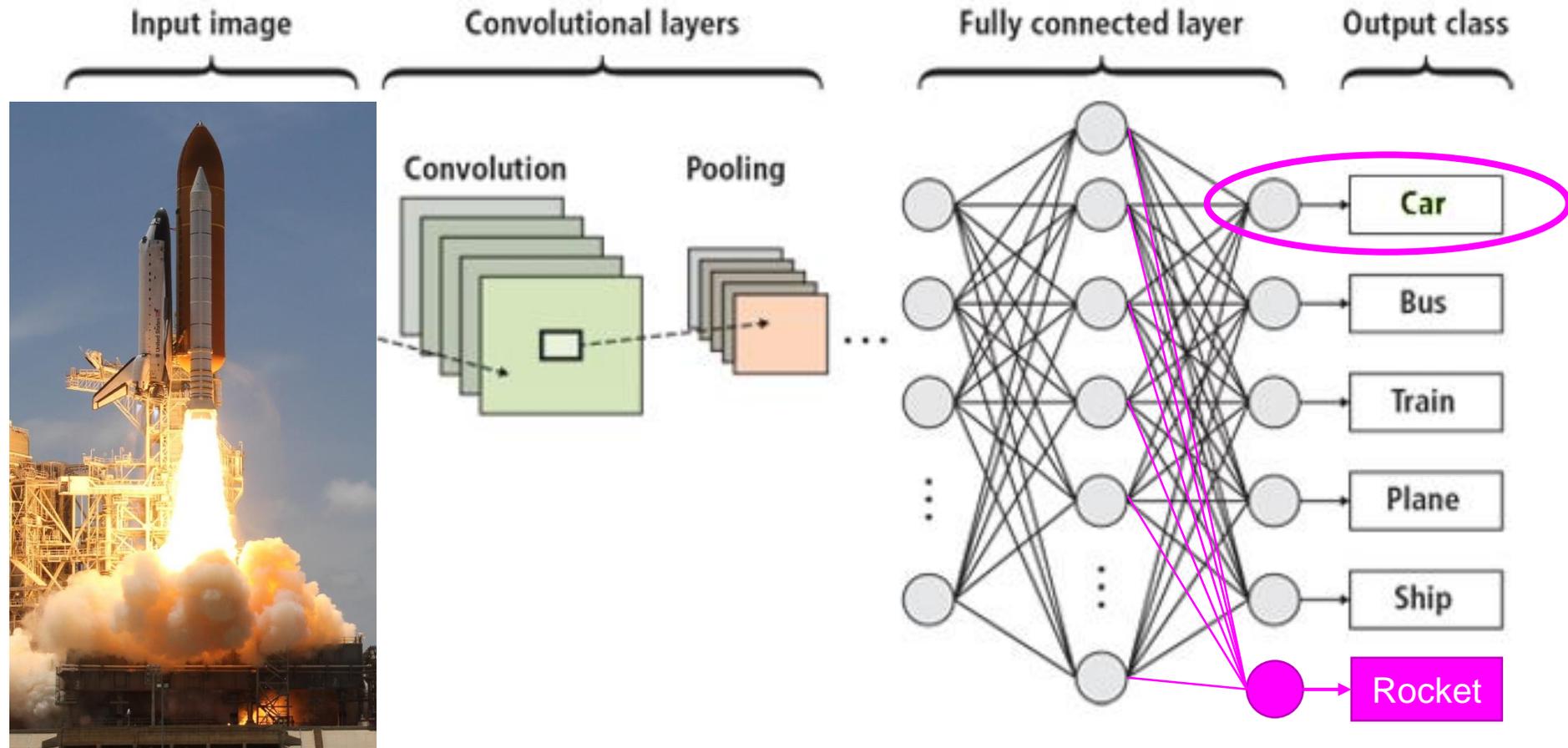
Agree, that we don't agree!!!



Smart Concept



Smart Concept



Certification



Certification – Human Factor

1. Skilled employee
2. Regular training



Certification – Human Factor

1. Skilled employee
2. Regular training

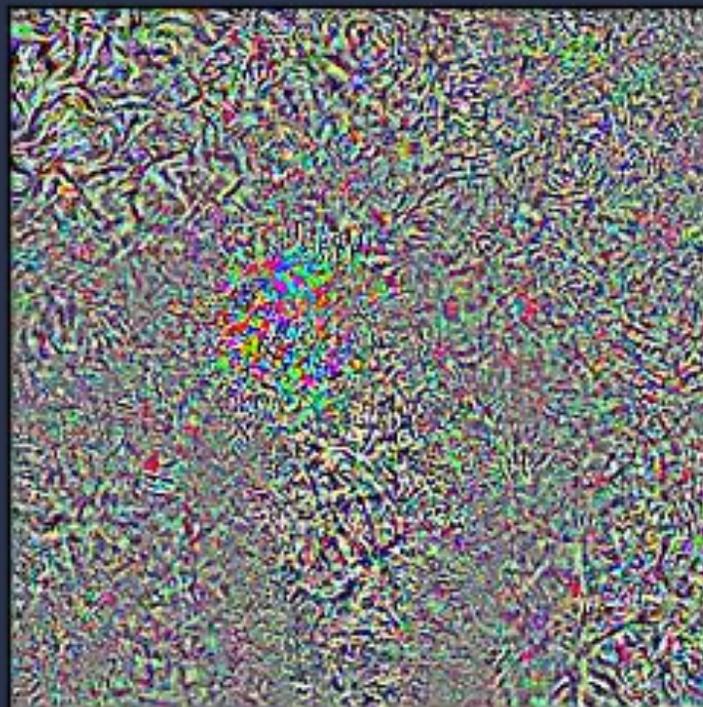


Robustness



Macaw 97.3%

+



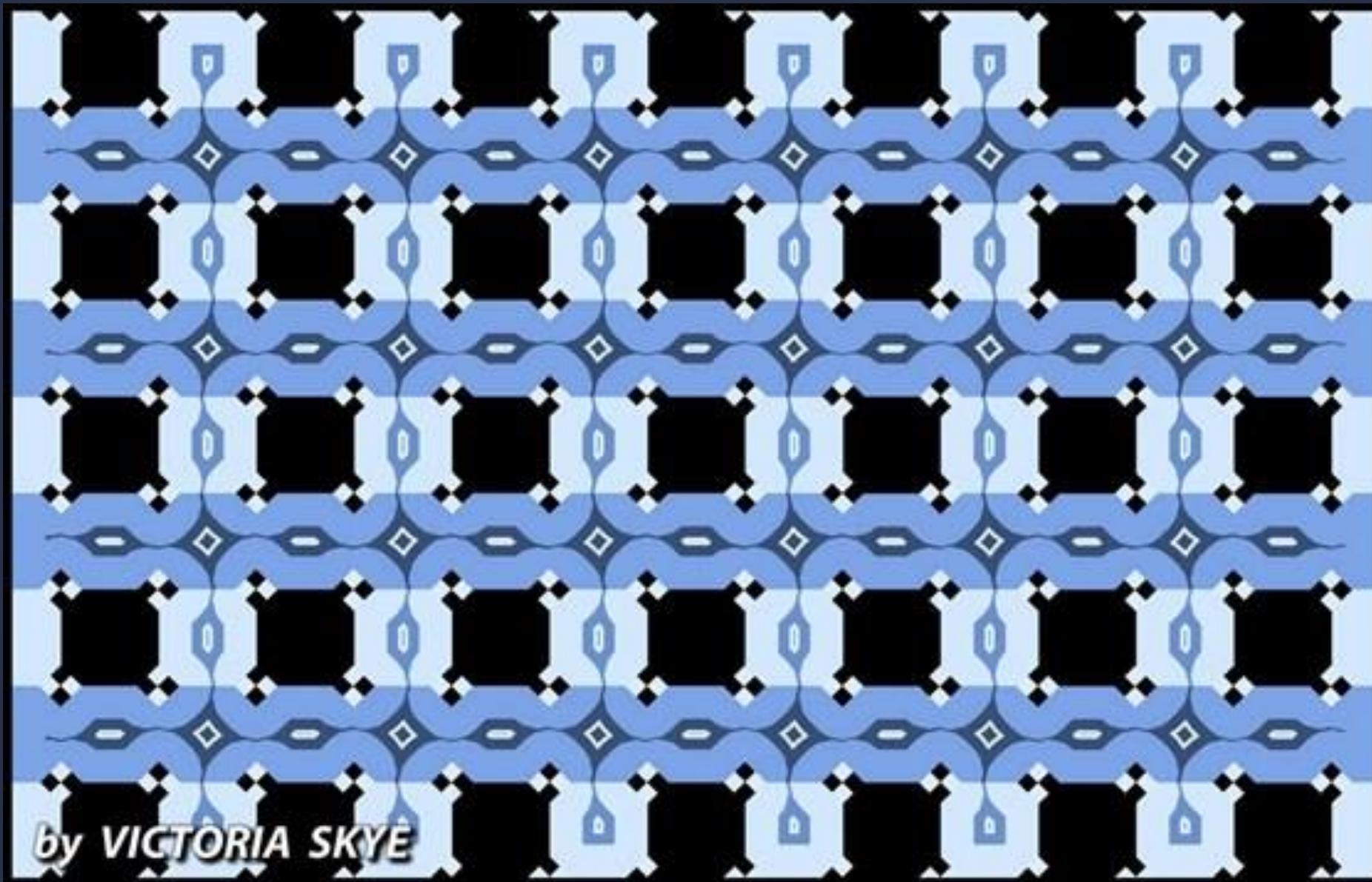
Noise

=



Bookcase 88.9%

Robustness – Human?



by VICTORIA SKYE

CSEM VISARD «Vision Automation Robotics Designer»

The screenshot displays the CSEM VISARD software interface. The main window is titled "C:\Users\Vision\Documents\Visard\Pumpomat\Pumpomat.vis - Visard v0.10.3.0". The interface is divided into several sections:

- Toolbox:** A vertical sidebar on the left containing various modules and tools such as Actuators, Administration, CBM, Connectors, Container, Data, GUI, IO, Logger, ML, Projects, Robotics, Scripting, Sensors, Test, Util.Trigger, Vision, Experiment Journal, Database (InfluxDB, MongoDB, MSSQL, MySQL, SQLite), FileSystem (CSV Logger, Image File Logger, Log File Cleaner, Video Logger, XML Logger), and Network (Win SCP, Logger).
- Module Selection:** A central area with four main categories: Vision (Exo Camera, Falcon LIC), Process (Pumpomat), Deep Learning (TF Image Anomaly Detector), and Logger (CSV Logger, MSSQL).
- Configuration Panels:** On the right, there are panels for "Exo Camera" (Module Settings, Appearance, Camera, Parameters, White Balance, Lens Control, Name, Module, Advanced) and "Blackboard Viewer".

The Blackboard Viewer shows a table of data:

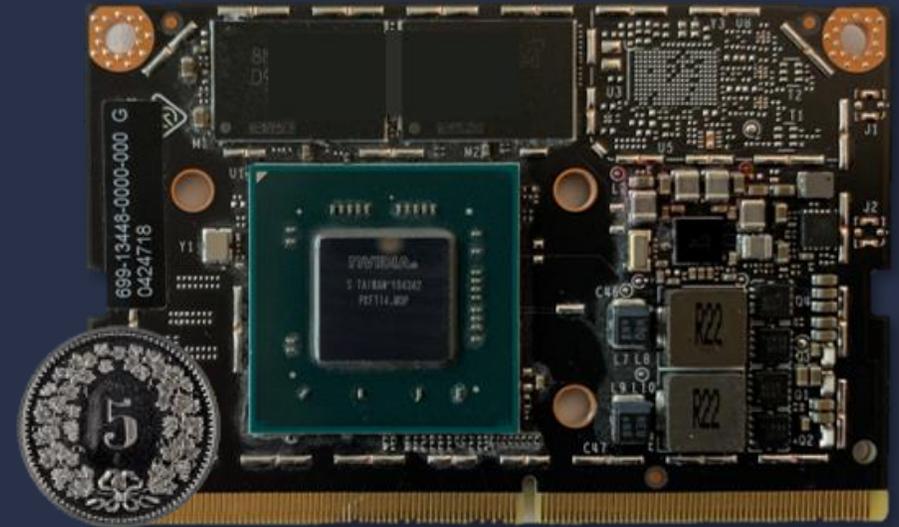
Fav	Module Full Name	Module Type	Value Name	Time Stamp	Value	Statistic	Value Type	Category	Log
<input type="checkbox"/>	/Project/ExoCamera	ExoCameraModule	Data	00:00:00...		0x @ 0.0 Hz	ImageModuleResult		
<input type="checkbox"/>	/Project/Pumpomat	PumpomatModule	Result	00:00:00...		0x @ 0.0 Hz	PumpomatResult	Pumpomat	
<input type="checkbox"/>	/Project/Pumpomat	PumpomatModule	Validation	00:00:00...		0x @ 0.0 Hz	ValidationResult	Pumpomat	

- ✓ PC-based
- ✓ Modular
- ✓ User-friendly
- ✓ Database logging
- ✓ Scripting tool
(similar IEC 61131)

VISARD on embedded AI computer



- ✓ Nvidia Jetson TX2i Quad Core GPU
- ✓ 512-core Volta GPU with Tensor Cores
- ✓ Passive cooled system



- ✓ Nvidia Jetson Nano
- ✓ 472 GFLOPs
- ✓ \$99

18,033 views | Aug 2, 2018, 01:29pm

How Swiss Federal Railway Is Improving Passenger Safety With The Power Of Deep Learning



Renee Yao Brand Contributor
NVIDIA BRANDVOICE

On a daily basis, Swiss Federal Railway (SBB) manages 10,671 trains, serving 1.26 million riders on 3,232 km of track. To ensure the safety of this infrastructure, as well as the safety of its passengers, SBB uses “diagnosis” trains equipped with multiple high-resolution cameras and other sensors to obtain images of railway tracks while traveling at speeds of up to 160 kmh.



August 3, 2018

DEEP LEARNING TOP 5

Insights into the new computing model



WEBINAR SERIES

Part 1: Improving Passenger
Safety with the Power of
Deep Learning

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GPU TECHNOLOGY
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