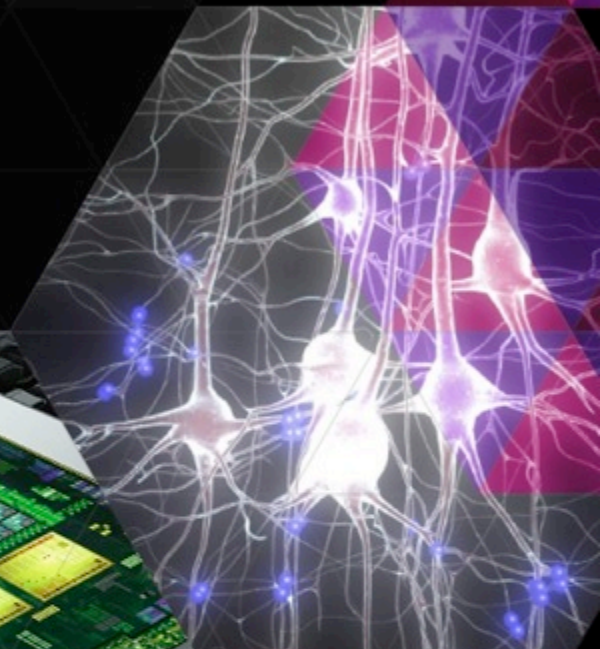
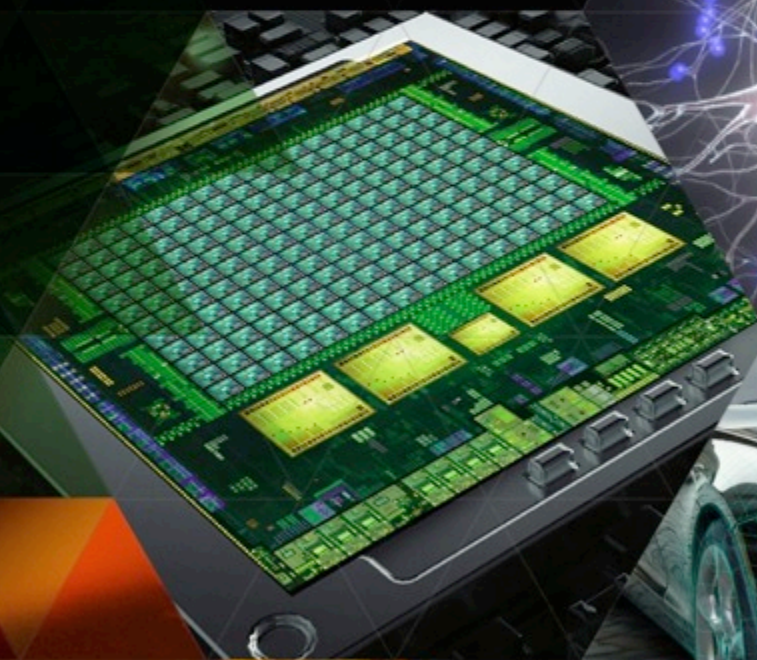




TOMORROW'S COMPUTING TECHNOLOGIES IN AUTOMOTIVE

NED FINKLE
VICE PRESIDENT
STRATEGIC MARKETING

NOV 5, 2014



STUNNING VISUAL EFFECTS



COMPUTER AIDED DESIGN



STYLING AND DESIGN



MONTEREY
FISH CO.

CUSTOMER
PARKING
ONLY

NO THROUGH
PASSAGE
COMMERCIAL
VEHICLES ONLY

WARNING/HAZARDS

HEAVY COMMERCIAL AREA
PROCEED AT YOUR OWN RISK.
KEEP AWAY FROM EQUIPMENT -
AND SECTIONS WITHOUT RAILINGS.
LOW VISIBILITY AT NIGHT -
UNEVEN SURFACE.

WARNING - HAZARDS

HEAVY COMMERCIAL AREA
PROCEED AT YOUR OWN RISK.
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LOW VISIBILITY AT NIGHT -
UNEVEN SURFACE.

SIMULATION MEANS BETTER PRODUCTS, FASTER

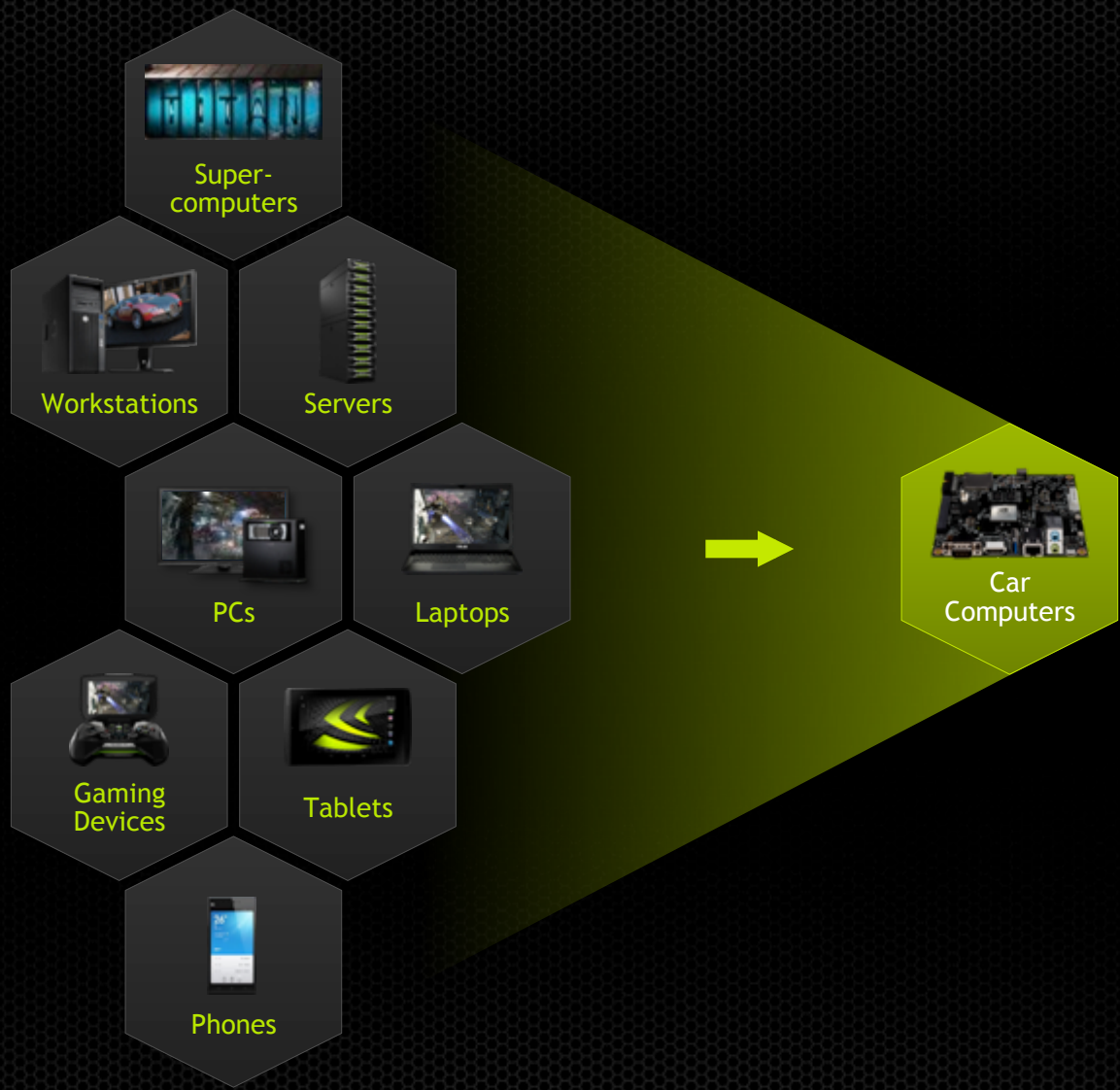


SIMULATION MEANS BETTER PRODUCTS, FASTER

INTERACTIVE POINT OF SALE



Silicon Valley



AUTOMOTIVE COMPUTING PLATFORM



Tegra Visual Computing Module




NVIDIA AUTOMOTIVE PARTNERS



TESLA



 **nVIDIA**
AUTOMOTIVE
BY THE NUMBERS

CARS ON THE ROAD

6.2M

MANY MORE COMING...

20⁺ Brands

100⁺ Models



SOFTWARE DEFINED CAR



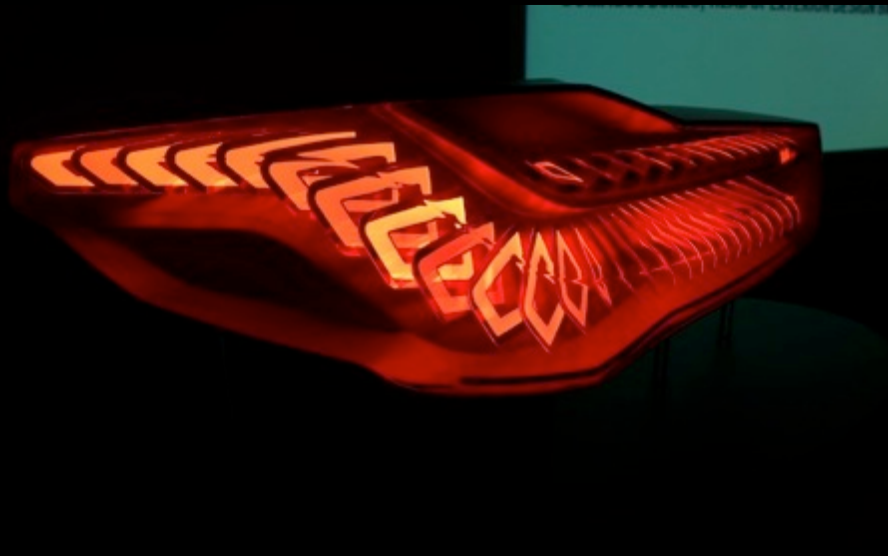
DISPLAY SURFACES TAKING OVER THE CAR



MERGE OF PHYSICAL AND DIGITAL



AUTOMOTIVE DETAILS



VIRTUAL COCKPIT



DIGITAL QUALITY GOAL

Craftsmanship

Create instrumentation so finely crafted that it is too expensive to physically build.

Design

Align with vehicle interior design and styling



UI COMPOSER

NVIDIA's HMI Platform

UI Composer Studio

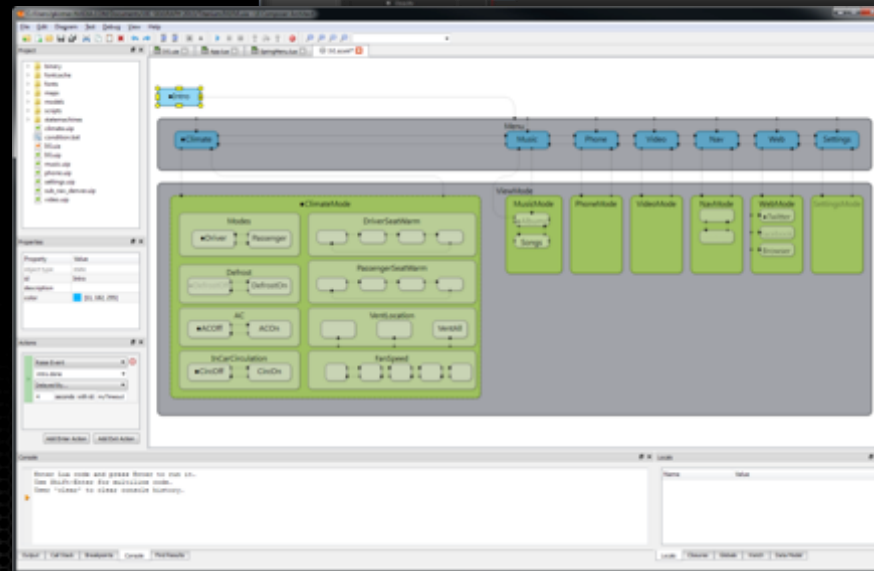
- Professional **design** environment

UI Composer Architect

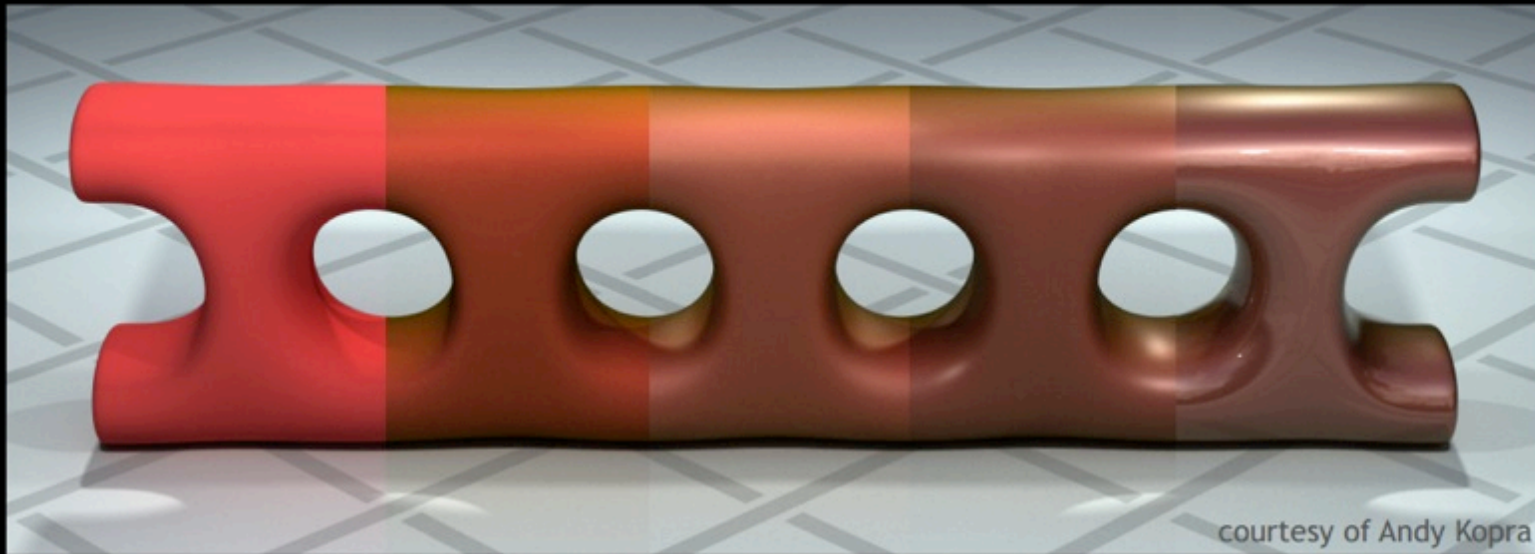
- Integrated **engineering** environment

UI Composer Viewer

- High performance **runtime**



MATERIAL DEFINITION LANGUAGE



diffuse

tint: red

diffuse

tint: yellow

glossy

roughness:

glossy

roughness:

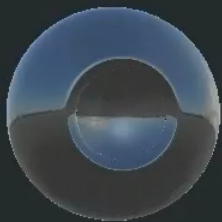
specular



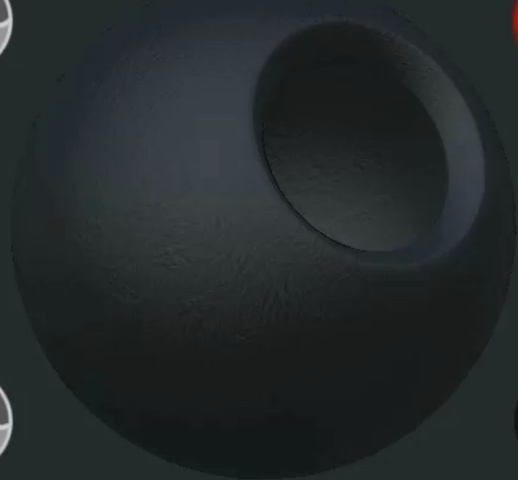
center

accent

ring



powder coat



⟨ beach ⟩
lighting

⟨ set 1 ⟩
materials

⟨ front ⟩
camera

GI



FX



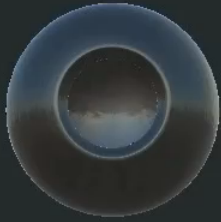
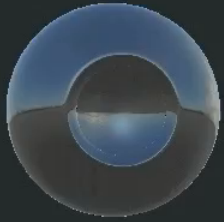
BG



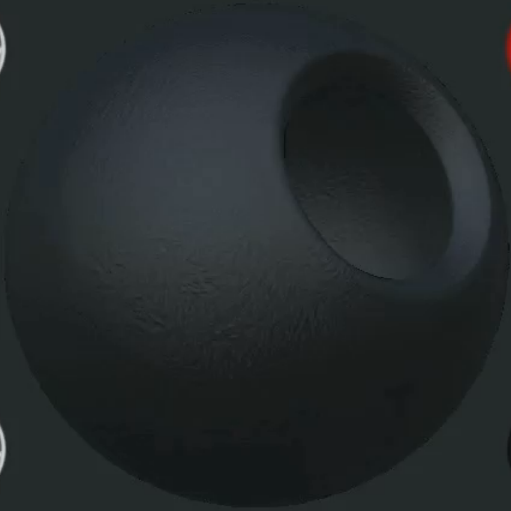
center

accent

ring



powder coat



⟨ beach ⟩
lighting

⟨ set 1 ⟩
materials

⟨ left ⟩
camera

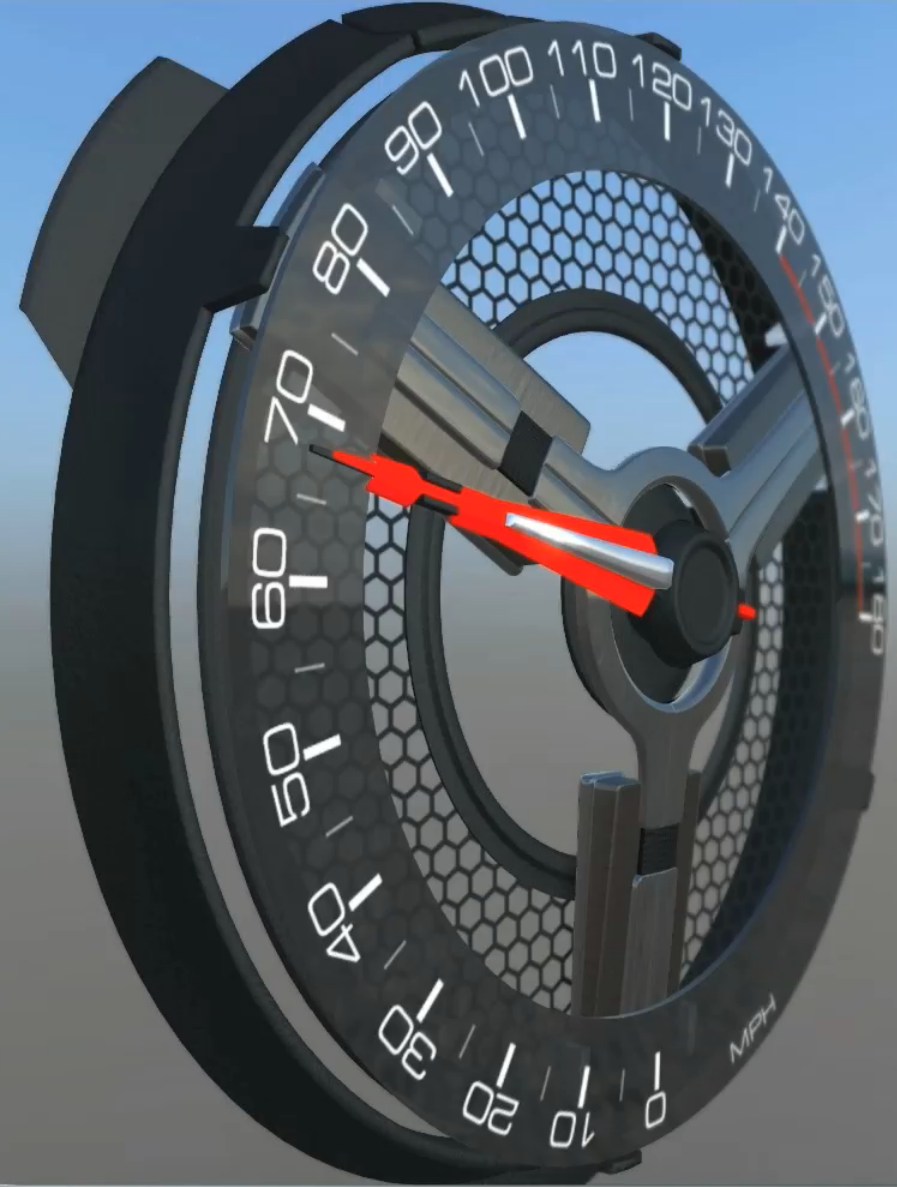
GI



FX



BG



The Science Behind the ART



PHOTOREAL RENDERING FOUNDATION

- ▶ Physically based lighting
- ▶ Physically based materials
- ▶ HDR: Full High dynamic range floating point pipeline

TECHNOLOGIES

- ▶ IBL: Image Based Lighting
- ▶ MDL: Material Definition Language
- ▶ Beam Traced Area Lights
- ▶ Subsurface Scattering Materials

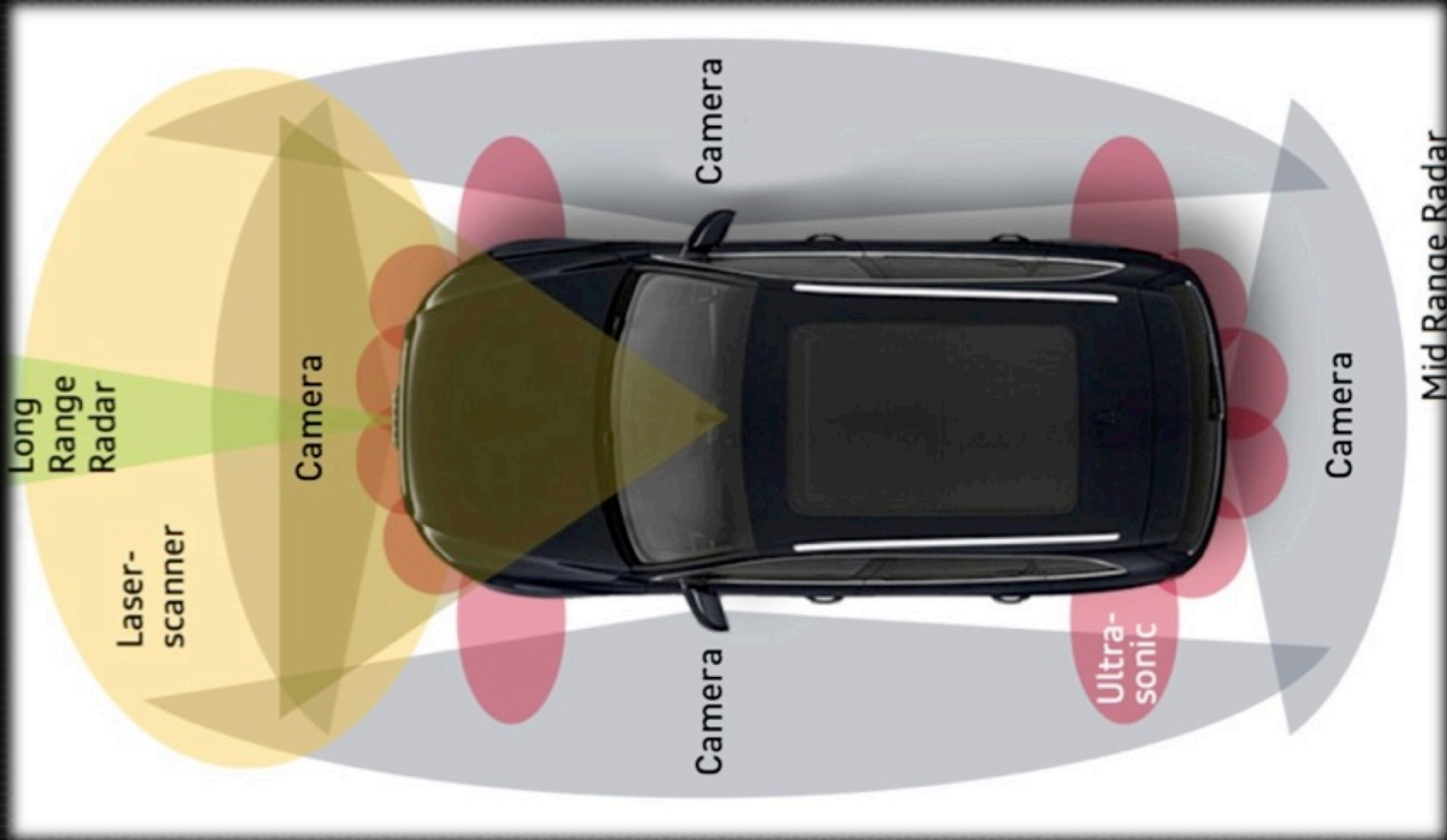
HARDWARE

- ▶ Tessellation Shaders
- ▶ Geometry Shaders
- ▶ Compute Shaders

EFFECTS

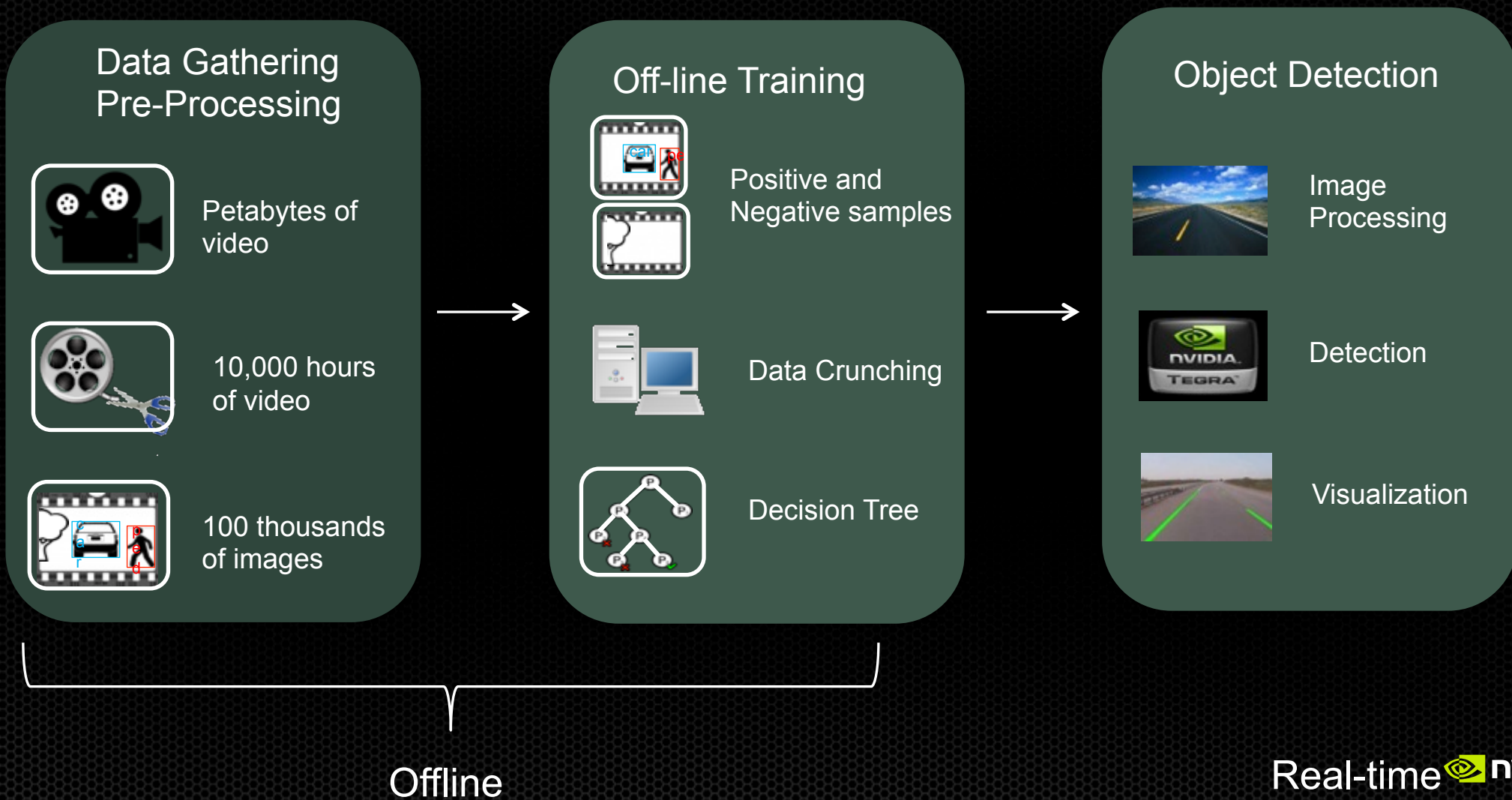
- ▶ Bloom & Tonemapping
- ▶ Depth of Field

Cars* are getting smarter ...



(*) Car Computers

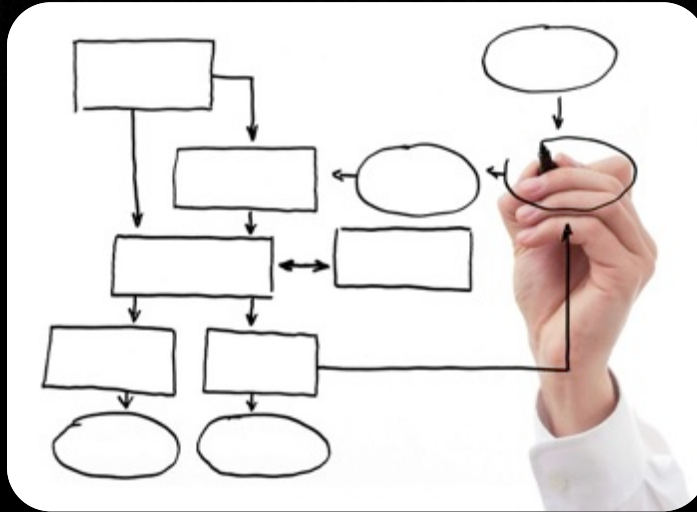
Today's Computer Vision Pipeline



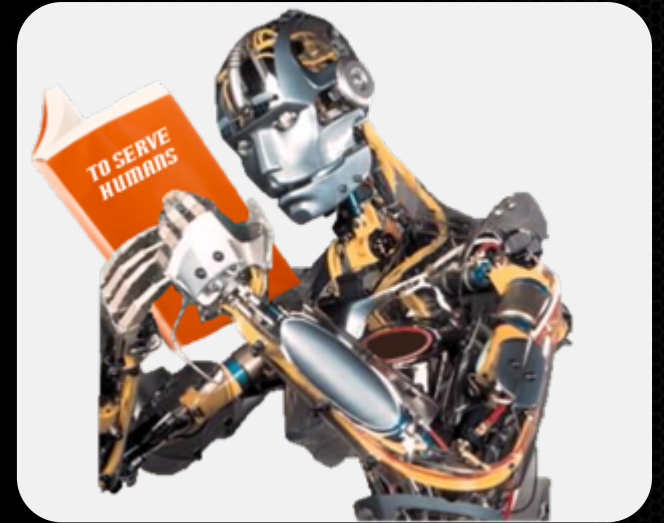
Evolution



Driver



Software Designer



Self Learning Machines



TECHNOLOGY INNOVATION ROUNDTABLE ISRAEL

NOV 5, 2014

Government of Israel



Economic Mission
to the West Coast

Foreign Trade
Administration Israel



HP
(Platinum Sponsor)



Lenovo
(Gold Sponsor)



DELL
(Gold sponsor)