



A.I in Automotive?
Why and When.

AGENDA

01

Definitions

02

A.I.?

03

A.I in automotive
Now?

04

Next big A.I
breakthrough
in Automotive

01 DEFINITIONS

DEFINITIONS

Artificial Intelligence

Artificial Intelligence:

Artificial intelligence (AI) is the intelligence exhibited by machines or software. It is also an academic field of study. Major AI researchers and textbooks define the field as "the study and design of intelligent agents", where an intelligent agent is a system that perceives its environment and takes actions that maximize its chances of success. John McCarthy, who coined the term in 1955, defines it as "the science and engineering of making intelligent machines".

[Wikipedia](#)

Warning: We are talking here of intelligent machines, not clever ones!

Deep Learning:

Deep learning is a set of algorithms in machine learning that attempt to model high-level abstractions in data by using architectures composed of multiple non-linear transformations.

Various deep learning architectures such as deep neural networks, convolutional deep neural networks, and deep belief networks have been applied to fields like computer vision, automatic speech recognition, natural language processing, and music/audio signal recognition where they have been shown to produce state-of-the-art results on various tasks.

[Wikipedia](#)

DEFINITIONS

Artificial Intelligence

Neural Network:

In computer science and related fields, artificial neural networks (ANNs) are computational models inspired by an animal's central nervous systems (in particular the brain) which is capable of machine learning as well as pattern recognition. Artificial neural networks are generally presented as systems of interconnected "neurons" which can compute values from inputs.

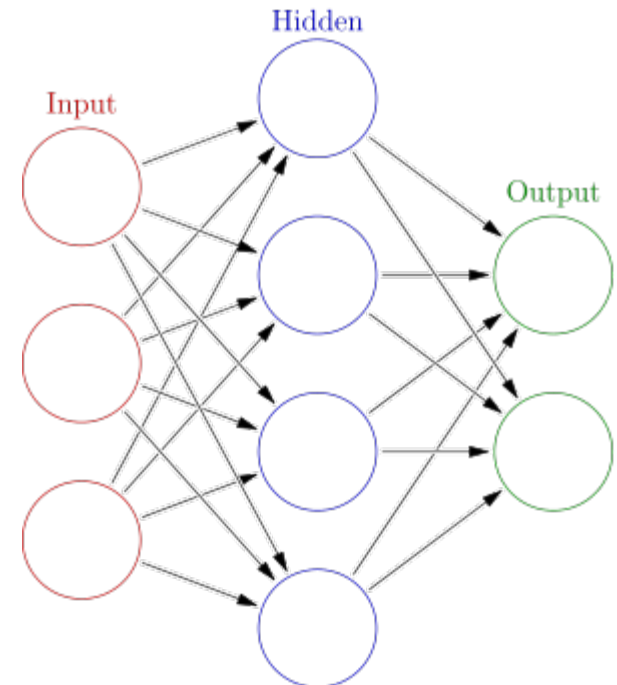
[Wikipedia](#)

A neural network is often a composition of nonlinear weighted sum:

$$f(\mathbf{x}) = K \left(\sum_i w_i g_i(\mathbf{x}) \right)$$

Where K is the activation function. For example, a Gaussian approximator:

$$\phi(v_i) = \exp \left(-\frac{\|v_i - c_i\|^2}{2\sigma^2} \right)$$



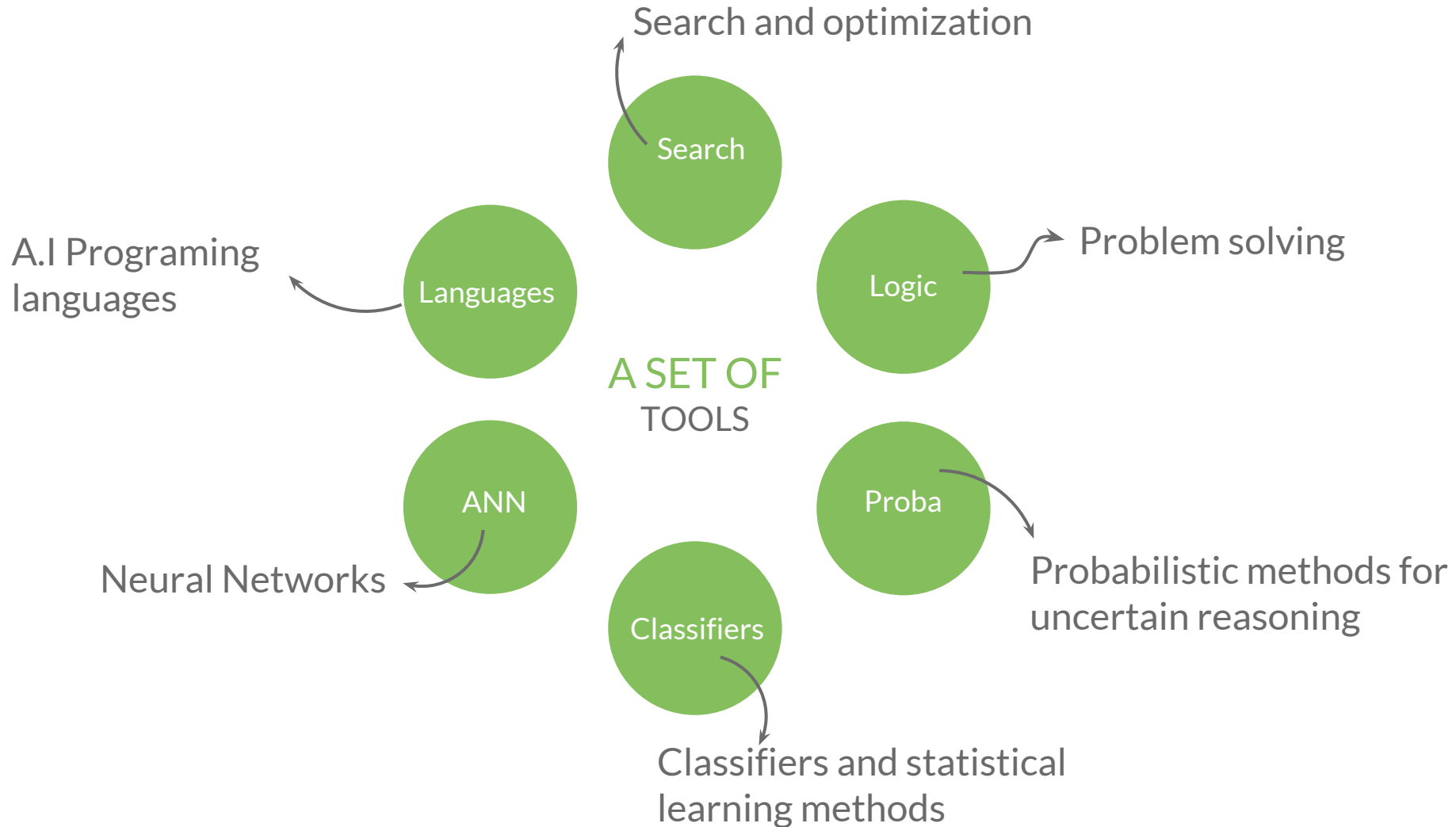
02

ARTIFICIAL INTELLIGENCE ?

Beyond the definition what is A.I ?

ARTIFICIAL INTELLIGENCE ?

A set of tools to solve problems



ARTIFICIAL INTELLIGENCE ?

A set of tools to solve problems

If we want to summarize a bit, Artificial Intelligence is about :

- Finding problems
- Searching for optimized solutions
- Looking for patterns
- Finding non obvious patterns
- Finding probability of upcoming events (prediction)
- Making deduction from incomplete patterns

03

A.I IN AUTOMOTIVE, NOW ?

What to expect from A.I in automotive, today ?

A.I IN AUTOMOTIVE NOW ?

What are the applications of A.I in Automotive today ?



Artificial Intelligence is **already everywhere in the car**. Let's do a little quizz here.

I will show you pictures of cars and you will tell me what intelligent algorithm runs in it.

A.I IN AUTOMOTIVE NOW ?

What are the applications of A.I in Automotive today ?

GENYMOBILE

Let IT be mobile



A.I IN AUTOMOTIVE NOW ?

What are the applications of A.I in Automotive today ?

GENYMOBILE

Let IT be mobile



Fuzzy Logic gearbox

A.I IN AUTOMOTIVE NOW ?

What are the applications of A.I in Automotive today ?

GENYMOBILE
Let IT be mobile



A.I IN AUTOMOTIVE NOW ?

What are the applications of A.I in Automotive today ?



Fuzzy Logic DSP transmission

A.I IN AUTOMOTIVE NOW ?

What are the applications of A.I in Automotive today ?

GENYMOBILE
Let IT be mobile



A.I IN AUTOMOTIVE NOW ?

What are the applications of A.I in Automotive today ?



External communication with sensors to:

- Operate the wheel
- Accelerator pedals and brakes
- Stay in its lane
- Maintain safe distance with previous driver
- Park itself

A.I IN AUTOMOTIVE NOW ?

What are the applications of A.I in Automotive today ?



04

A.I IN AUTOMOTIVE, TOMORROW

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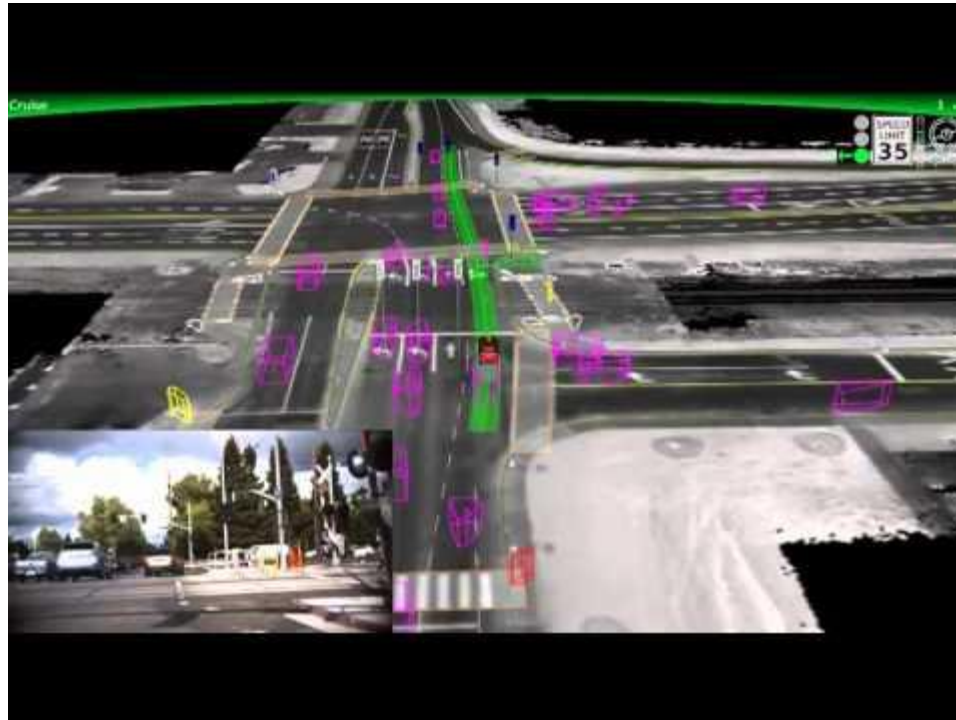
What are the next A.I breakthrough in Automotive ?

A.I IN AUTOMOTIVE TOMORROW ?

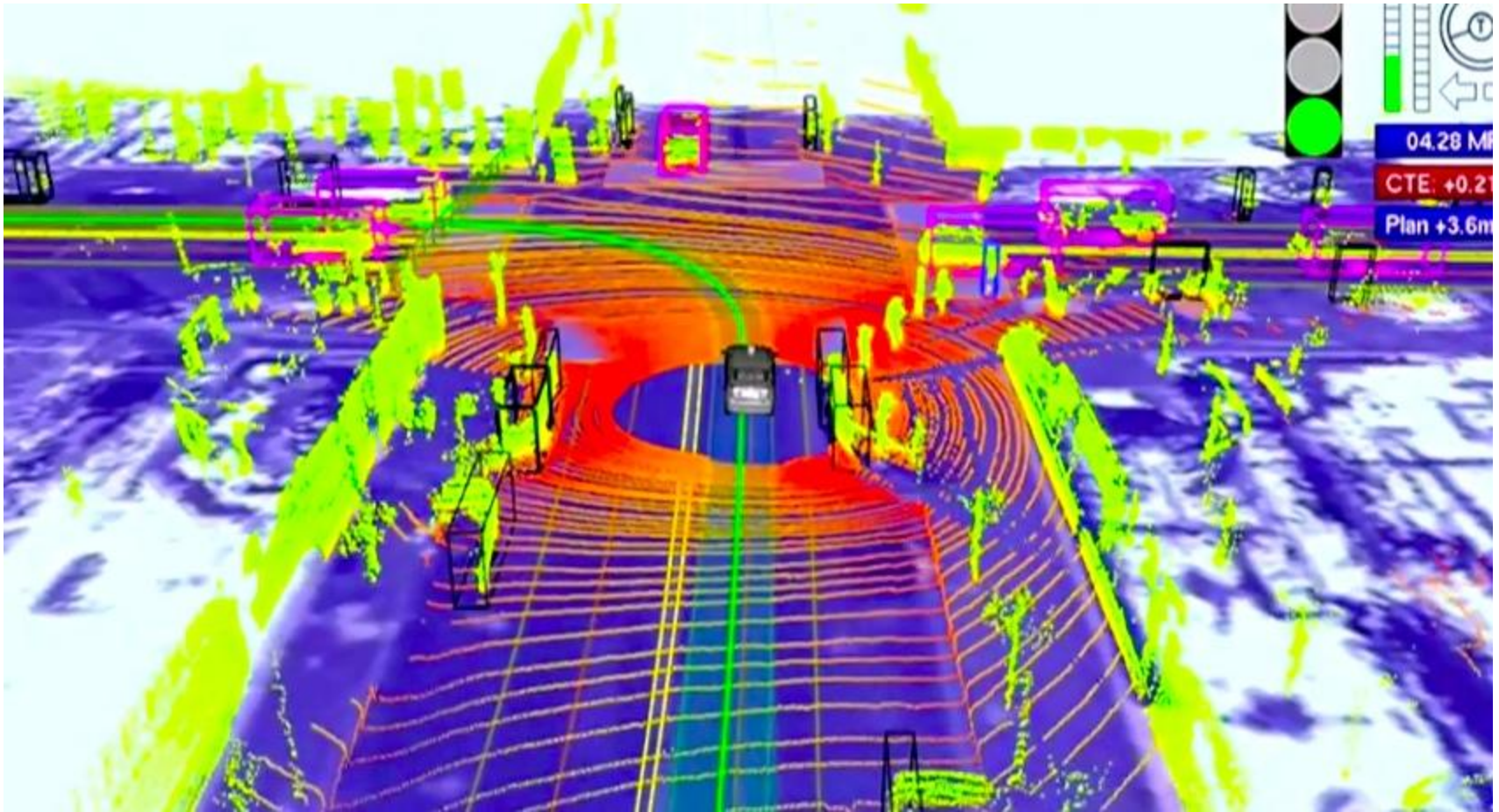
GENYMOBILE
Let IT be mobile



A.I IN AUTOMOTIVE TOMORROW ?



A.I IN AUTOMOTIVE TOMORROW ?



A.I IN AUTOMOTIVE TOMORROW ?



Robocar are great and every OEM is announcing his own before 2020 (over promise, under delivery).
But what else can we do with AI in a car ?

What do you think should or will be the usage of Artificial Intelligence in car ?

A.I IN AUTOMOTIVE TOMORROW ?



Here are some of my own picks:

- Identify dangerous driving behaviors.
- Monitoring driver's condition
- More clever lane crossing alert with auto path correction
- Collaborative optimization of traffic jam by car to car to cloud AI communication.
- Algorithm that allows Tesla to adapt their dual motor traction thousands times a second in the model x Tesla, will be generalized to many “actuators”
- Car to infrastructure communication
- Adapt X-47B kinds of technologies to correct car’s path according to road condition, weather, wind, slope, etc.

I will finish by a question more than by a prediction : What would be the AI grammar for automotive?

ANY QUESTION ?

Time for Q&A

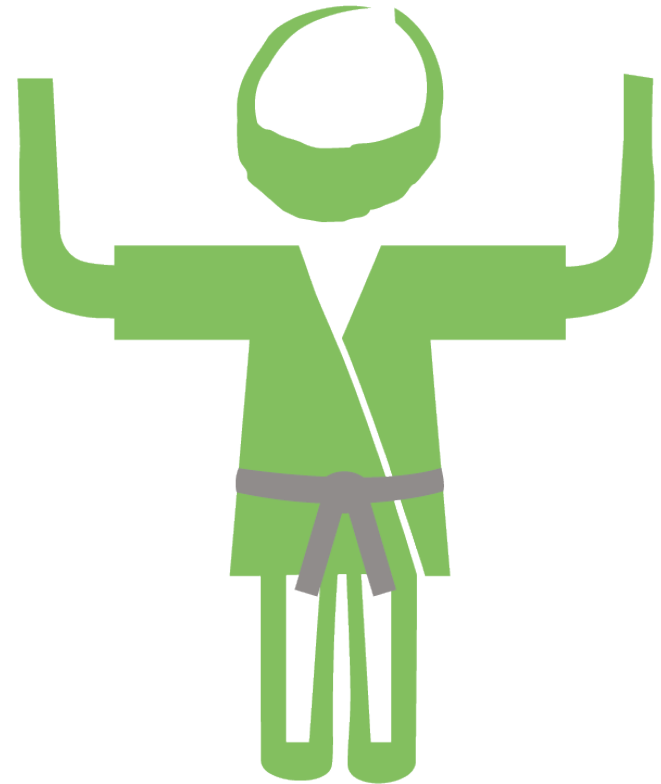
Now is the good time to ask me your questions.

Please flash the following QRCode to get the slides on Genymobile Google Drive:



Thank You for your time !

Feel free to get in touch
with me after the talk!



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