New platform for assessment and certification of AI for autonomous driving
Make AI verifiable and certifiable - “TÜV for AI”

AI will be the enabling technology for SAE level 4 & 5 driving

framework for AI regulation, verification and certification is necessary

verification of AI is an unsolved challenge today
Challenges …

- Solving technical aspects
- Common understanding of quality of AI
- Responsibility & accountability
- Global cooperation
open cooperation platform with many participants to address the challenges of machine learning and to share the knowledge

lean and agile structures for all contributors working on their self-invest to be flexible and efficient

find methods to understand, validate and verify machine learning algorithms
GENESIS structure

- **Steering Board**
  - DFKI
  - TÜV SÜD
  - New Board Member

- **Development Board**
  - **Spotlight 1:** DNN Debugger
    - Closed Data
    - Open Data
    - Results
  - **Spotlight 2:** Quality of training data
    - Closed Data
    - Open Data
    - Results
  - **Spotlight 3:** t.b.d.
    - Closed Data
    - Open Data
    - Results
  - **Spotlight n:** t.b.d.
    - Closed Data
    - Open Data
    - Results

- **Public Domain**
  - new participants

- **Contribute**
  - request for participation
  - directly
GENESIS description

Participants
Everyone can participate in the GENESIS collaboration platform and benefit from it. Companies and research institutions can organize themselves in the spotlight projects. Individuals, such as students, can benefit from the results in the public domain and contribute there.

Steering board
Steering board members are founders and annual financial contributors. Purpose of the steering board is to manage and maintain the scope of genesis, to integrate new spotlight projects in development board, to administer the collaboration platform and to act as a first contact.

Development board
The development board is formed by the participants of the spotlight projects. They will regularly exchange with each other about the progress, the direction and the globally technical questions of GENESIS.
GENESIS description

Spotlight projects
Spotlight projects are individual projects of several technical scopes within the GENESIS collaboration, which can benefit from the provided infrastructure, the collaboration of various contributors and their open exchange. A spotlight project can be formed by one or more participants with a new aspect or improved approach for research regarding a safe behaviour of AI. The detailed collaboration organization between partners within a spotlight project (like MoU's, NDA's, Closed-Source, etc.) should be defined individually – the only requirement is that the results of a spotlight project should be open available.

Public domain
The GENESIS project is planned as an open collaboration platform, so everybody (free user account will be necessary) should get access to the results of the spotlight projects and - depending on the agreements of the particular spotlight project – maybe also to the sources of the project.

Infrastructure
The framework and infrastructure for the collaboration platform GENESIS is currently in clarification. It might possibly happen in collaboration with Eclipse Foundation.
GENESIS membership

Spotlight projects
Send request for participation to genesis@tuev-sued.de including information:
- title of spotlight project
- your contact information
- if you are looking for, or if you bring partners with you
- objective of your spotlight proposal
- description of your approach
- definition of data privacy

The requests will be considered every two months by the steering board

Steering board
A participation process for the steering board is currently pending
GENESIS timeline

Idea of GENESIS

Cooperation DFKI & TÜV Süd

Definition of GENESIS scope and structure

Press release about GENESIS

Several requests from interested partners

Today

Definition of GENESIS infrastructure and governance

Get IT infrastructure running and become productive!

Become capable to assess AI

First spotlight project „DNN Debugger“

New spotlight projects

Q1-2018

Q2-2018

Q3-2018

Q4-2018

2019

....

New spotlight projects
(More) Transparent DNNs Through Hybrid Learning
Hybrid Learning: “Old School“ vs. „New School“

Examples (training data)

Explainable (to some extend)

Not explainable but better performance (on many problems)
Example of Explainable Hybrid Deep Neural Net

Pre-trained feature A
eg. „has eyes“

Pre-trained feature B
eg. „walks upright“
Example of Explainable Hybrid Deep Neural Net

Forward propagation of features

Backpropagation adapting weights

Pre-trained feature A
eg. „has eyes“

Pre-trained feature B
eg. „walks upright“
Example of Explainable Hybrid Deep Neural Net

Interpretation of (hypothetic) results
Thank you for your attention!

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