

## Deep Learning for Self-Driving Cars

**Completely autonomous driving will not be possible until a vehicle can independently recognize and assess any driving situation or situation in its surroundings, even if highly complex, and make decisions based on this assessment. This challenge can only be met using state-of-the-art approaches to artificial intelligence, which are currently under development by Professor Sepp Hochreiter and his team.**

Long Short-Term Memory (LSTM) is currently “the hottest technology around, when you need to process sequential inputs,” says Hochreiter. LSTM is a neural net that can recognize and selectively store whatever may be needed at a later time, for example the words in a sentence. Today, LSTM is used in virtually every mobile phone. Hochreiter would now like to apply it to autonomous driving.

In most current applications used for autonomous driving, decisions are made based on images from a particular point in time. Using LSTM, Hochreiter hopes to move beyond decisions based on a single point and use information from a wide range of times, combining it into decisions that are more robust, reliable and quicker during autonomous driving.

To achieve this, neural nets are used to constantly evaluate camera images and other sensor data. This should allow situations to be recognized and anticipated that are encountered over the course of time but that cannot be reliably recognized from a single image, e.g. the turning maneuver of another vehicle, how a pedestrian behaves in response to a car, or how two children that are communicating with each other behave in response to a car. Additionally, the LSTM4Drive project will integrate the aspect of alertness.

The goal of the project is, with the aid of LSTM, to be able to make actual, fair driving decisions.