

EMBEDL | BOSCH

# Rapid Development of a Deep Learning Model with Optimal Performance on Target Hardware

Bosch uses Embedl's SDK for optimizing Deep Learning applications for multiple hardware.

## THE CHALLENGE

Optimizing Deep Learning (DL) models for target hardware is a challenging process that requires broad skills and a significant amount of time. The challenge gets bigger for every new hardware target. Embedl's tools are developed for automotive customers to overcome these challenges. The scope of the project was for the DL engineers at Bosch to use Embedl's Model Optimization SDK to optimize one of Bosch's proprietary DL models for two different hardware targets.

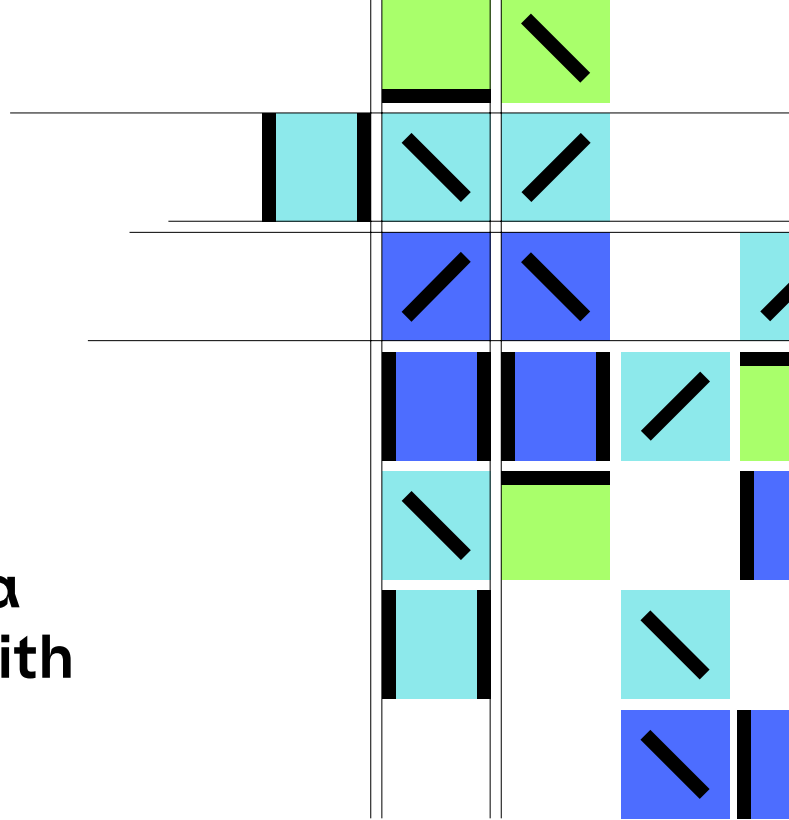
## THE SOLUTION

Bosch has integrated Embedl's Model Optimization SDK in their training pipeline. This allowed Bosch Interior Sensing Solutions to get access to a range of new tools for efficient DL model development. The optimizations were carried out by Bosch engineers without Embedl having access to either data or models. The project included optimization with hardware-aware neural architecture search and pruning, as well as mixed precision quantization and hyperparameter optimization.

## THE OUTCOME

Just a week after receiving Embedl's software, engineers at Bosch produced an optimized model where half of the original latency could be removed without accuracy loss. At the end of the project, by using various state-of-the-art algorithms included in the SDK, they were able to reach even higher performance with one of their proprietary interior sensing models for multiple hardware (CPU and DSP). The tools from Embedl are ready to be used in production projects.

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## EMBEDL

WEBSITE  
[embedl.com](https://embedl.com)

FOUNDED  
**2018**

HEADQUARTERS  
**Göteborg, Sweden**

NO. OF EMPLOYEES  
**10–50**



## Embedl crafts incredibly efficient deep learning models.

Embedl's tool makes your DL model smaller, faster, and more energy efficient by providing state-of-the-art model optimization.

## ABOUT STARTUP AUTOBAHN

STARTUP AUTOBAHN powered by Plug and Play is an open innovation platform that provides an interface between innovative tech companies and industry-leading corporations. The basis of the program is the partnership that develops between startups and the corporate business units. The two entities hold an equal footing from the get-go: together they evaluate the potential for a joint venture, move forward to pilot the technology, and work to achieve the ultimate goal – a successful production-ready implementation. Designed with the intention to exceed startup acceleration, STARTUP AUTOBAHN powered by Plug and Play moderates a community for collaboration with a focus on implementable results. Over the years, the platform has successfully cultivated over 400 projects with more than 300 startups since its founding in 2016.

## ACKNOWLEDGEMENTS

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