

R&D of State Transition Matrix Model Checking Technology for Automotive Embedded Software

<Program for Fostering Regional Innovation (Global Type) >

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Enterprises

CATS Co., Ltd.

Purpose of the Research

Ensuring of functional safety State transition matrix (Notation)

Model checking (Validation method)

First stage of the intelligent cluster

State transition matrix model checking technology (Garakabu)

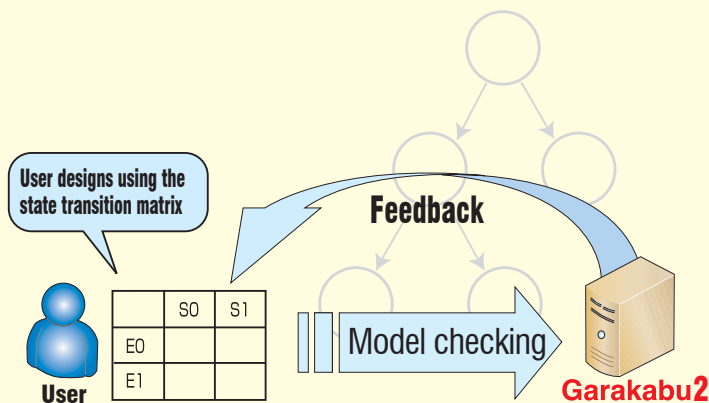
Second stage of the intelligent cluster

Enhance it to be used for software embedded in onboard equipment

Theme 1: Research and development of state transition matrix model checking technology for automotive embedded software

Summary of the Research

In the automotive industry, ensuring of functional safety is an important issue. The state transition matrix model checking technology is a technology to support ensuring of functional safety by utilizing the state transition matrix, which is widely used in designing software embedded in automotive equipment, to perform model checking, and is a technology researched and developed in the first stage of the intelligent cluster creation project. In this research and development, we are going to optimize the state transition matrix model checking technology for the use in the automotive industry at first, and then, we are going to make a more large-scale model checking of the state transition matrix possible by parallelizing and encoding. With this research, it will be possible to develop products which support ensuring of functional safety in the automotive industry.

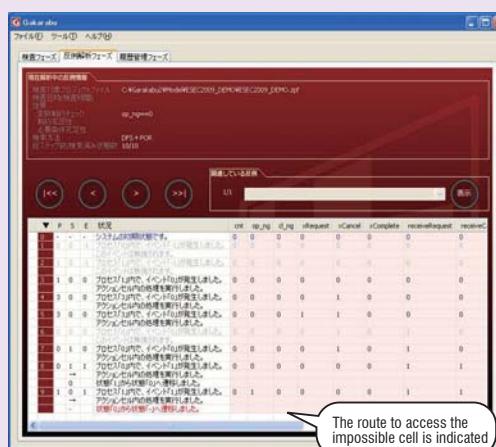


Results of the Research

The **Garakabu2** is a validation tool using the model checking dedicated to the state transition matrix.

The model checking is, not an actual software code, but a method to validate by expressing with numerical formula or the like and by proving mathematically that it contains no error using a software.

Currently, the **Garakabu2** finds a flaw in design by using the state transition matrix (ZIPC project file) as an input, and by using this method of model checking.



Prospective Fields of Application

- Aircraft
- Space development
- Medical equipment
- Railroad
- Automobile



Information

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Information

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