SIListra Systems press statement / Dresden, August 6th 2019

[Headline] Diversified Encoding - an approved diagnostic method to detect hardware execution errors

[Sub headline] Application for safety critical software development

[Front matter] Teaser/Introduction

Diversified encoding is a method to diagnose hardware execution errors in safety critical systems. This diagnostic method enables to timely handle these kinds of hardware errors. The special feature of Diversified Encoding is that it does not require a detailed hardware analysis and special self-tests for the hardware error modes of the used hardware. Established solutions often rely on additional or special hardware – for example they might use full 2-channel hardware solution or a LockStep-CPU. Whereas Diversified Encoding can be implemented on **c**ommercial **o**ff-**t**he-**s**helf hardware. Hence, this method is of interest for all safety critical projects, where hardware error diagnostic must not or cannot be implemented in hardware. In the first half of 2019 **TÜV SÜD Rail** successfully approved Diversified Encoding of SIListra Systems GmbH for safety critical projects.

[Main matter] Details

Diversified Encoding relies on Coded Processing. Coded Processing detects errors in the data flow of programs with the help of information redundancy. Diversified Encoding relies on two logical software channels. These two channels are implemented completely in software and do not require any special hardware features. The “native channel” is the original safety function that was programmed by the developer. The “encoded channel” is the original safety function with Coded Processing. Due to Coded Processing the encoded channel can already detect errors by itself. The combination of both channels increases the error detection probability even further. The Diversified Encoding Framework controls both channels: the framework distributes the inputs to both channels and it safely combines the output of both channels to one safe output. Protocol stacks for safe network communication are typically part of both channels to check safe input datagrams and to generate safe output datagrams. Furthermore, the encoded channel contains fine-granular and patented control flow checks. The control flow checks are integrated with Coded Processing and check every control flow instruction at runtime.

The TÜV SÜD Rail GmbH successfully approved the Diversified Encoding method of SIListra Systems GmbH as part of a concept audit. The goal of the audit was an application of Diversified Encoding in the context of the IEC 61508 (up to SIL3). Besides of the method itself TÜV SÜD also reviewed the Coded Processing solution of SIListra Systems GmbH, the control flow checks and the achieved error detection probabilities. The successful approval enables the use of Diversified Encoding of SIListra Systems GmbH in IEC 61508 projects (up to SIL3) and similar applications areas, for example for automation solutions.

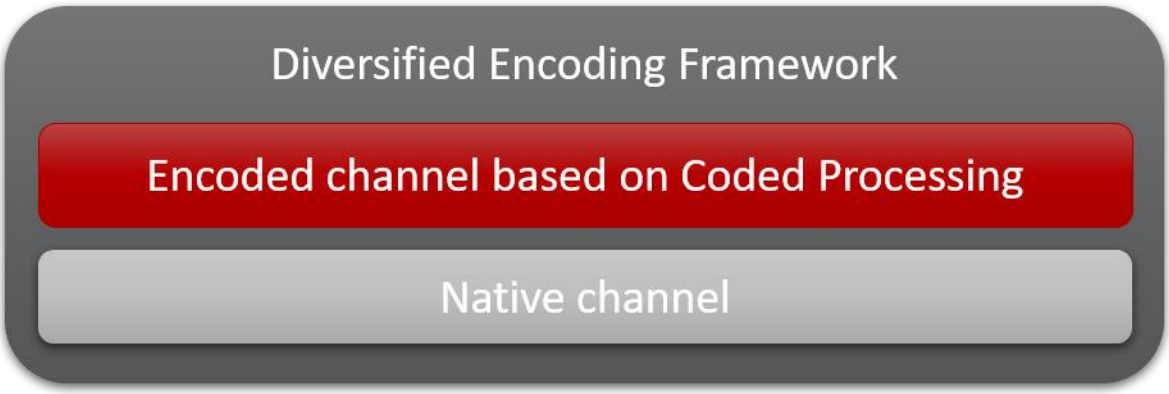

Image: SIListra Systems GmbH

About SIListra Systems:

The SIListra Systems GmbH is an innovate IT-company, that was founded in 2012 as spin-off of the TU Dresden. Our founders worked on the special software-methods and their implementation in development tools already before the spin-off. The entry of the majority shareholder TraceTronic GmbH in the year 2016 gave a push to the market entry of production ready SIListra solutions. More information about the company and its solutions are available under: silistra-systems.com.

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