

Tomorrow's Reliability Today's Must-Do's

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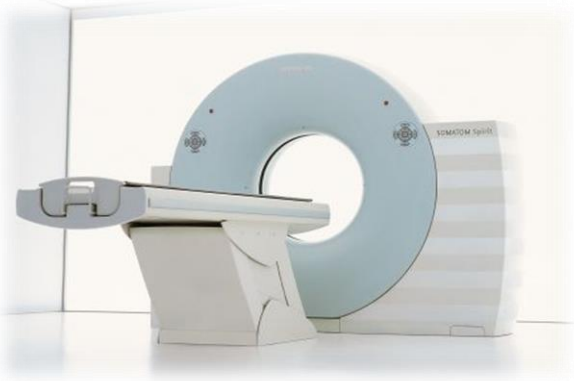
PLOT CONFERENTIE
TOMORROW'S RELIABILITY

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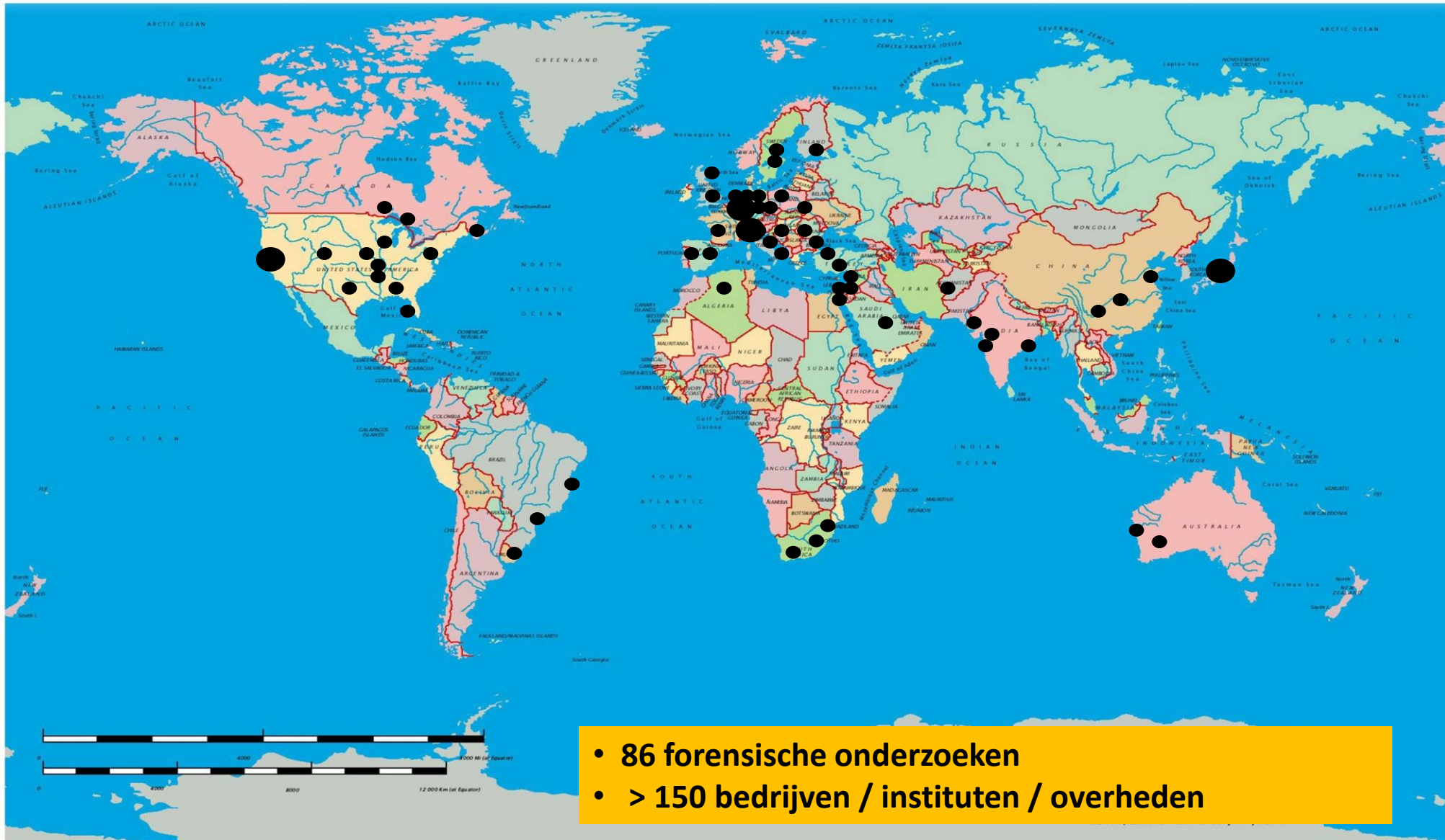
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Context: Complex Hybrid Systems



Forensic Investigations 2005 - 2018



Agenda

- What is Reliability?
- A short tour through the “Land of Failures”
- Industry challenges
- Must-Do's



Defining our terms

Reliability:

the quality of being trustworthy or of performing consistently well [Oxford Dictionary].

Product Quality:

a multidimensional concept expressing or indicating the satisfaction of various stakeholders (each with their own explicit or implicit requirements, expectations and views) with a delivered product/service.

... a “random post-release defect” ...





▲ De populaire Toyota Prius hybride in een showroom in Tokio. © EPA

Toyota roept in Nederland 60.000 auto's terug

In Nederland moeten ruim 60.000 auto's van Toyota terug naar de garage. Volgens het autoconcern zijn er technische problemen met de airbags. Het gaat om voertuigen tussen de elf en achttien jaar oud. Laat een woordvoerder weten.

Economieredactie 01-11-18, 10:00 Laatste update: 12:35



58



26



Profiteer hier!



NET BINNEN

- 11:00 Politie gaat testen met onopvallende...
- 06:00 Ken jij de verkeersregels? VVN ko...
- 05:00 'Semi-autonoom rijden leidt tot dra...
- 05-11 Belg reist van Thailand naar Belgi...
- 05-11 Fransen mogen als protest spotgo...
- 05-11 Ruimte-Tesla is al voorbij Mars
- 05-11 Tesla, hier komen - braaf!
- 04-11 Uber wil weer de weg op met zelfr...
- 03-11 Auto's helpen straks zelf tegen wa...
- 03-11 Stationwagon of SUV: wat zijn de...

Een dagje uit met hoge korting



BEKIJK NU >



AUTOTEST



Poor Quality will hit you hard !



Social Media even harder !!!!!!!

HOW TO SAFELY CHARGE YOUR GALAXY NOTE 7





**Design Flaws due to lack of
use modelling**



Product Reliability: Society & Security Impact





Failures in safety-
mechanisms due to
unrecognized
operating conditions



Challenges

- **Software Reliability not well understood compared to ‘traditional reliability’ (related to hardware/mechanical engineering)**
- **‘Act-once’ systems/products in mission critical systems not having preceding trends of material deterioration, degrading performance or indicators:**
 - **Airbags**
 - **Interlock components**
 - **Fail/safe systems**
- **For hybrid systems:**
 - **Many ‘Fail Once / Fail Immediate’ situations**
 - **Critical incidents of failure are extremely hard to analyze (e.g. in case of no physical evidence present like ruptures, stress or fatigue symptoms)**

Must-Do's

- Understand reliability !
 - What does it mean to you? What does it mean for the product?
- Understand the (technical) risks to your product
 - Have a risk management process / approach
 - Do use process & design FMEAs
 - Consider out-of-context usage (“foreseeable misuse”)
 - Consider the ‘In-system’ aspects of individual components/parts
- Harvest your (free!!) quality data from the field / users
 - Objective and subjective quality data
 - Do adequate root cause analysis on post-release quality issues
- Match verification/testing techniques with the intended use & operating conditions



Thank you !
Questions, or interested in learning more?

Feel free to contact me:
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Or find me on:



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