# Occupational Safety and Health Webinar:

# Scalable Fault Tree Analysis by Model Checking

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| Date: | 23rd August 2022 (Tuesday) |
| Time: | 7:00 pm – 8:00 pm in Hong Kong time |
| Format: | Online meeting (Link will be provided upon successful enrolment) |
| Language: | English (with English presentation materials) |
| Deadline for enrolment: | 21st August 2022 (5:00pm) |

## Content:

Fault trees are pivotal in safety and reliability engineering. They are applied at industrial scale, and have been subject to standards in many application areas. Modern fault-tree dialects can model redundancies, functional dependencies, repairs, spare elements, activation mechanisms, and so forth. Their analysis is however a serious bottleneck: analysis techniques do not scale and require manual effort.

We will show how techniques from model checking can be used to:

a. simplify fault trees prior to their expensive analysis;
b. generate state spaces in a very efficient and incremental way;
c. analyse measures that go beyond reliability and availability, and
d. enable the analysis of gigantic fault trees.

We explain the key algorithmic principles and showcase its improvement on some industrial cases: the safety for autonomous vehicle guidance, the criticality analysis of railway infrastructure, and the reliability analysis of nuclear power plants.

A tool demonstration on top of the Storm model checker will illustrate the modelling and analysis capabilities.

## Speaker:

1. Joost-Pieter Katoen is a distinguished professor at RWTH Aachen University. He co-authored more than 300 papers, is a member of the Academia Europaea, ACM Fellow, received an honorary doctorate from Aalborg University and holds an ERC Advanced Grant. He led numerous projects with major industrial partners.

2. Falak Sher Vira, a Ph.D in probabilistic verification from RWTH Aachen and postdoc from Fortiss Germany, heads DGB Technologies LLC. He works with academia to solve industrial problems e.g. reliability and performability analysis; integration of model-based engineering with safety assessment.

Joint Organisers:

iosh Hong Kong

HKARMS 香港風險管理與安全協會 Hong Kong Association of Risk Management and Safety

Supporting Organisations:

SOCIETY OF REGISTERED SAFETY OFFICERS 註冊安全主任協會

HKIE THE HONG KONG INSTITUTION OF ENGINEERS 香港工程師學會 Nuclear Division 核子分部

Hong Kong Branch Institution of MECHANICAL ENGINEERS

| Details: | |
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| Participants: | 300 (on a first-come-first-served basis) |
| Who should attend: | This is open to members of IOSH Hong Kong and the supporting organisations.<br><br>Admission is free of charge and prior enrolment is required.<br><br>If applying through the enrolment link (https://forms.gle/DAU66NVssBtPe18W9) for the organising and the supporting organisations, registrants MUST select the CORRECT affiliation and provide the CORRECT membership number in the online enrolment form; otherwise, the enrolment will ultimately be rejected.<br><br>If you are not a member of the organising and the supporting organisations, or you forgot your membership number, you are still very much welcome to join the webinar by applying through this link: https://iosh.zoom.us/meeting/register/tZ0kdOugqTwoH9X-rhwPq-vEgLeSveBKZgbT and no CPD cert will be provided.<br><br>We are sorry that we have no resources or mechanism to provide or check your membership number for you.<br><br>IOSH Hong Kong reserves the right to reject any of the enrolments in any circumstances and for whatever reasons.<br>For inquiries, please contact our Administrative Officer at 9025 6767 or by email at ioshhongkong@gmail.com. |
| CPD: | 1-hour CPD certificates will be provided to the members of IOSH Hong Kong and the supporting organisation(s) who have successfully enrolled through the above-mentioned link and attended the whole webinar. |

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