

ICFEM 2024 Program (preliminary)

SFVPP 2024 Symposium

2 December 2024

9:15 ~ 9:25 Opening

9:25 ~ 10:25 Keynote Talk

Some Achievements of the International Joint Research Project "Formal Analysis and Verification of Post-quantum Cryptographic Protocols"

Kazuhiro Ogata

10:25 ~ 10:40 Coffee Break

10:40 ~ 12:20 Formal Methods

Generating Simulink Models from Hybridised Event-B Models

Neeraj Singh, Guillaume Dupont, Yamine Ait Ameer and Marc Pantel

Towards a Novel Approach to Railway Safety using STPA and Promise Theory

Felix Schaber, Atif Mashkooor and Michael Leuschel

Formal Specification and Model Checking of a Synchronous Leader Election Protocol in Maude

Tomoyoshi Ogura, Kazuhiro Ogata and Canh Do

Functional Modelling of the Matroid and Application to the Knapsack Problem

Zikang Wan, Zhen You, Chen Zhang, Zhengkang Zuo, Changjing Wang and Qimin Hu

12:30 ~ 14:00 Lunch

14:00 ~ 15:15 Testing and Analysis

Automated Software Test Input Generation with Diffusion Models

Yujin Zhu, Xiujing Guo, Hiroyuki Okamura and Tadashi Dohi

A Framework for Standardized Partitioning Analysis in Integrated Modular Avionics Systems

Jilu Zhang, Yong Cai and Weikai Miao

Improving and Evaluating Sparse Decision-Based Black-Box Attacks and Defenses

Jonas Brager Jacobsen, Jingyue Li and Mathias Lundteigen Mohus

15:15 ~ 15:30 Coffee Break

15:30 ~ 16:20 Formal Semantics

An Executable Operational Semantics of Quantum Programs and Its Application

Canh Minh Do and Kazuhiro Ogata

Relational Denotational and Algebraic Semantics Based on UTP

Zhiru Hou and Huibiao Zhu

16:20 ~ 17:35 Defect Detection

S3DA: A 3D point cloud based PCB solder defect detection algorithm

Yilongfei Xu, Zhewei Wang, Jinhao Liang, Yueling Zhang, Jincan Feng, Weikai Miao, Jiangtao Wang and Geguang Pu

ASTD Patterns for Integrated Continuous Anomaly Detection In Data Logs

Chaymae el Jabri, Marc Frappier and Pierre-Martin Tardif

The Three-point Optimization Algorithm: A novel Physics-based metaheuristic approach

Xiong Deng, Shaoying Liu and Yanli Liu

18:30 ~ 20:30 SFPVV 2024 Banquet

3 December 2024

9:15 ~ 10:15 Keynote Talk

Developing the industrial-strength tools for modeling, testing and verification: A formal-methods perspective

Geguang Pu

10:15 ~ 10:45

10:45 ~ 12:25 Specification and Implementation

Consistency Naming between Requirements Analysis and Specifications

Fumiko Nagoya

Recovery of Trace Links Between a SOFL Formal Specification and its Corresponding Incomplete Java Code

Jiandong Li, Shaoying Liu and Zhi Jin

A Methodology for Rating Maintainability Metrics of SOFL Formal Specifications

Yu Du and Shaoying Liu

12:30 ~ 14:00 Lunch

14:00 ~ 15:15 Language and Blockchain

A Common Declarative Language for UML State Machine Representation, Model Transformation, and Interoperability of Visualization Tools

Ali Jannatpour and Constantinos Constantinides

Blockchain Solutions for Cash-on-Delivery: Utilizing Encrypted NFTs, Smart Contracts, and IPFS Technology

Bang Le, Trung Phan and Son Ha Xuan

Revolutionizing Animal Health Privacy: Blockchain and Encrypted NFTs

Bang Le, Trung Phan and Son Ha Xuan

15:15 ~ 15:20 Closing

ICFEM 2024 Main Conference

4 December 2024

9:15 ~ 9:30: Opening

9:30 ~ 10:30 Keynote Session

Formal Specification of Autonomy Features with ARE and KnowLang

Mike Hinchey

10:30 ~ 11:00 Coffee Break

11:00 ~ 12:30 Modeling and Specification

NL2CTL: Automatic Generation of Formal Requirements Specifications via Large Language Models

Mengyan Zhao, Ran Tao, Yanhong Huang, Jianqi Shi, Shengchao Qin, Yang Yang

Repairing Event-B Models through Quantifier Elimination

Tsutomu Kobayashi, Fuyuki Ishikawa

Tuning Trains Speed in Railway Scheduling

Étienne André

12:30 ~ 14:00 Lunch

14:00 ~ 15:30 Timed Automata

The Bright Side of Timed Opacity

Étienne André, Sarah Dépernet, Engel Lefauchaux

Clock-Dependent Probabilistic Timed Automata with One Clock and No Memory

Jeremy Sproston

Efficient State Estimation of Discrete-Timed Automata

Julian Klein, Paul Kogel, Sabine Glesner

15:30 ~ 16:00 Coffee Break

16:00 ~ 17:30 Improving Neural Networks

LRNN: A Formal Logic Rules-Based Neural Network for Software Defect Prediction

Yuxiang Shang, Shaoying Liu

Quantitative Symbolic Robustness Verification for Quantized Neural Networks

Mara Downing, William Eiers, Erin DeLong, Anushka Lodha, Brian Ozawa Burns, Ismet

Burak Kadron, Tevfik Bultan

Graph Convolutional Network Robustness Verification Algorithm Based on Dual
Approximation

Dongdong An, Jianqi Shi, Jing Liu;

18:30 ~ 20:30 Conference Reception

5 December 2024

9:15 ~ 10:15 Keynote Talk

Synthesizing (Differential) Invariants by Reduction Non-Convex Programming to SDP

Naijun Zhan

10:15 ~ 10:45 Coffee Break

10:45 ~ 12:15 Formal Analysis

Formal Kinematic Analysis of Epicyclic Bevel Gear Trains

Kubra Aksoy, Adnan Rashid, Sofiene Tahar

Deciding the synthesis problem for hybrid games through bisimulation

Catalin Dima, Mariem Hammami, Youssouf Oualhadj, Régine Laleau

Formal Analysis of FreeRTOS Scheduler on ARM Cortex-M4 Cores

Chen-Kai Lin, Bow-Yaw Wang

12:30 ~ 14:00 Lunch

14:00 ~ 15:30 Defect Detection

Differential Property Monitoring for Backdoor Detection

Otto Brechelmacher, Dejan Nikovic, Tobias Nießen, Sarah Sallinger, Georg Weissenbacher

MemSpate: Memory Usage Protocol Guided Fuzzing

Zhiyuan Fu, Jiacheng Jiang, Cheng Wen, Zhiwu Xu, Shengchao Qin

Formalizing Potential Flows using the HOL Light Theorem Prover

Elif Deniz, Sofiene Tahar

15:30 ~ 16:00 Coffee Break

16:00 ~ 17:20 Panel Discussion

What Roles Can Formal Methods Play in the AI Era.

18:30 ~ 20:30 Conference Banquet

6 December 2024

9:15 ~ 10:15 Keynote Talk

Challenges and Opportunities in Assurance of Software Defined Vehicle

Mark Lawford

10:15 ~ 10:40 Coffee Break

10:40 ~ 12:10 Formal Verification

The Continuum Hypothesis Implies the Existence of Non-Principal Arithmetical Ultrafilters

-- A Coq Formal Verification

Guowei Dou, Si Chen, Wensheng Yu

Observability of Boolean Control Networks: New Definition and Verification Algorithm

Guisen Wu, Zhiming Liu, Jun Pang

On-the-Fly Proof-Based Verification of Reachability in Autonomous Vehicle Controllers

Relying on Goal-Aware RSS

Peter Riviere, Tsutomu Kobayashi, Neeraj Singh, Fuyuki Ishikawa, Yamine Ait Ameer, Guillaume Dupont:

12:30 ~ 14:00 Lunch

14:00 ~ 16:00 Model Checking

Efficient SMT-Based Model Checking for HyperTWTL

Ernest Bonnah, Luan Nguyen, Khaza Anuarul Hoque

A Tableau-based Approach to Model Checking Linear Temporal Properties

Canh Minh Do, Tsubasa Takagi, Kazuhiro Ogata

Simple LTL Model Checking on Finite and Infinite Traces over Concrete Domains

David Doose, Julien Brunel

Model Checking Concurrency in Smart Contracts with a Case Study of Safe Remote Purchase

Yisong Yu, Naipeng Dong, Zhe Hou, Jin Song Dong

16:00 ~16:10 Closing