

# AUBE '24

## 18<sup>th</sup> International Conference on Automatic Fire Detection & Suppression, Detection and Signaling Research and Applications Conference

# SUPDET 2024

## Final Program

September  
24-26, 2024  
Duisburg  
Germany

Ver. 7, 19.9.2024

First Day - 24.9.2024 - Room MD 162

- 09:00 **Registration**
- 10:30 **Opening** by Amanda Kimball & Andreas Czylwik
- Session 1: Performance of Fire Detection Systems I**  
Session Chair: Thomas Cleary
- 10:50 **Early Fire Detection in Evolving Multivariate Time Series Data Using Anomaly Detection Techniques**  
Pascal Vorwerk, Jörg Kelleter, Ulrich Krause
- 11:10 **Fire Protection Requirements for IT Rooms and Data Centers**  
Bettina Bormann, Heike Siefkes, Torsten Pfeiffer
- 11:30 **Performance of New Smoke Alarms to a Range of Nuisance Cooking Sources in a Mock Kitchen**  
Amy Mensch, Thomas Cleary, Emma Veley
- 11:50 **Lunch**
- Session 2: Smoke Detector Replacement I**  
Session Chair: Lance Rütimann
- 13:20 **Enhancing Safety: Strategic Fire Detector Replacement for Risk Reduction**  
Sebastian Festag
- 13:40 **Exchange of Smoke Detectors in Switzerland**  
Kurt Girschweiler
- 14:00 **Determining the Optimum Replacement Period of Optical Smoke Detectors and Alarms**  
Gemma Sambells, Raman Chagger
- 14:20 **Break**
- Session 3: Smoke Detector Replacement II**  
Session Chair: Lance Rütimann
- 14:40 **Aging Impact on the Behaviour of Fire Detectors in an Office Environment – Test Results and Experiences**  
Thorsten Schultze
- 15:00 **Aging Study on Smoke Alarms**  
Karoliina Meurman
- 15:20 **Panel Discussion**
- 16:00 **End of the First Day**
- 18:00 **Snack and Tour at Landschaftspark Nord (Steel Production Industrial Heritage)**

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# SUPDET 2024

A U B E ' 2 4

Second Day - 25.9.2024 - Room MD 162

Session 4: Smoke Detection and Characterization I

Session Chair: Jörg Kelleter

09:10 [Fire Incident Type Detection Using a Simple Optical Cell](#)

Osman Özyurt

09:30 [Fire Detection Method Based on the Dual-Wavelength Light Scattering and Extinction](#)

Xiang Zhang, Yuxin Kang, Gang Liu, Yang Chen, Hongyong Yuan, Tao Chen, Lida Huang

09:50 [Smoke-Methane Composite Detector with Simultaneous Detection of Scattering and Extinction Signals](#)

Yang Chen, Hongyong Yuan, Songfeng Yin, Kedi Wang, Kaiyuan Li

10:10 [Break](#)

**Session 6: Smoke Detection and Characterization II**

Session Chair: Aleksandar Duric

10:30 [The Effect of Concentration and Particle Size Distribution from Cooking Nuisance Source on Smoke Alarms](#)

Emma Veley, Thomas Cleary, Amy Mensch

10:50 [The Impact of Soot Aging on Smoke Detector Response](#)

Thomas Cleary

11:10 [A Framework to Model Light and Smoke Interaction from Fire Simulation Data Using the Ray Tracing Methodology](#)

Kristian Börger, David Eduardo Teran Parrales, Alexander Belt, Lukas Arnold

11:30 [A Smoke Detection Method Based on Scattering Spectrum](#)

Xiang Zheng, Tian Deng, Shu Wang, WenBo Xu, Wei Liu

11:50 [Lunch](#)

**Session 8: Fire Characterization**

Session Chair: Sebastian Festag

13:20 [Particle Property Parameters' Influence on Light Scattering: A DDSCAT Simulation Study](#)

Lu Yang, Jun Fang, Zhenhai Qin

13:40 [Research on Multi-Detector Device for Reconstructing Flammable Gas Concentration Distribution](#)

Gang Liu, Hongyong Yuan, Kaiyuan Li, Lida Huang, Yang Chen

14:00 [Prospects and Challenges of Radar-Enabled Fire Sensing](#)

Francesca Schenkel, Thorsten Schultze, Christoph Baer, Ilona Rolfes, Jan C. Balzer, Christian Schulz

14:20 [Reformulation of the Combustion Efficiency Measurement using a Phi Meter](#)

Ryan Falkenstein-Smith, Thomas Cleary

14:40 [Break](#)

**Session 10: Fire Detection in Special Applications**

Session Chair: Amanda Kimball

15:00 [Comparative Study of Smoke Generators for Aircraft Application](#)

André Freiling, Thorsten Schultze

15:20 [Fire Detection and Fire Fighting Testing on Railway Vehicles – New Developments](#)

Peter Stahl

15:40 [Novel Approach to Enhance Fire Protection in Aircraft Cargo Compartments using UHF-RFID Temperature Sensing Tags and Advanced Algorithmic Analysis](#)

Matthew Karp

16:00 [End of the Second Day](#)

18:30 [Boat Tour on the River Rhine and Conference Dinner](#)

Second Day - 25.9.2024 - Room MC 122

Session 5: Suppression I

Session Chair: Stefan Bieder

09:10 [Detecting Firefighter's Tenability Utilizing Machine Learning](#)

Qi Tong, Hongqiang Fang, Eugene Yujun Fu, Wai Cheong Tam, Thomas Gernay

09:30 [Remote Monitoring and Testing of Fire Pump Systems – Practical Applications and Recent Changes to Codes & Standards](#)

Travis Montembeault

09:50 [Evaluation of the Impact of Foam Packaging Materials on Water-based Fire Suppression](#)

Dong Han, Gang Xiong

10:10 [Break](#)

**Session 7: Suppression II**

Session Chair: Amanda Kimball

10:30 [A Comparative Case Study of Sprinkler Performance from Fire Tests of 18650 Lithium-ion Cells in Plastic Trays within Rack Storage Test Configurations](#)

Ben Gaudet, Phil Friday

10:50 [A Reduced-Scale Inert Gas Extinguishing Test](#)

Jon Zimak, Raphael Ogabi, Milosh Puchovsky, Albert Simeoni

11:10 [Detached Houses, for Residents with Substance Abuse and Mental Disorders, with Installed 'State of the Art' IG-541 \(Inergen®\) Extinguishing System](#)

Arjen Kraaijeveld, Gambhir Paudel

11:30 [Evaluation of R-Bulbs for SMART Sprinkler Applications](#)

Yogish Gopala, Lorenz Boeck, Yibing Xin, Sergey Dorofeev, Juergen Teschner, Bodo Mueller

11:50 [Lunch](#)

**Session 9: Suppression III & Fire Spread I**

Session Chair: Bettina Bormann

13:20 [Study on Fire Hazard and Smoke Flow of Rigid Polyurethane Foam in Construction Sites](#)

Hironchi Ebata, Katsuya Okayasu, Shinji Nagasawa

13:40 [Prepriming of Fluorine-Free Foam Systems](#)

Jeremy Souza

14:00 [The Influence of Ambient Factors on Fire Detection Based on Numerical Simulation](#)

H.Y. Wang, Z.H. Sun, R. Pan, Y.H. Yuan, M.Y. Huang, S.F. Yin, X. Chen

14:20 [Modeling Sprinklers and Fire Control & Suppression in FDS](#)

Jennifer Wiley, Noah Ryder, Steven Strege

14:40 [Break](#)

**Session 11: Fire Spread II and Wildfires**

Session Chair: Andreas Czulwik

15:00 [Effects of Heat Radiation and Fuel Surface Temperature on Mass Loss Mechanism of Compressed Air Foam](#)

Fengyuan Tian, Jun Fang, Lulu Fang, Hassan Raza Shah, Xuqing Lang, Zhijian Tian, Fei Tang

15:20 [Different Classification Solutions for Feature-based Algorithms for Early Wildfire Detection](#)

Julia Kunz, Kurt Winter

15:40 [SmokeFormer: Decision Ensemble Transformer for Early Wildfire Smoke Detection in Videos](#)

Chen Xu, Chong Wang, Qixing Zhang

16:00 [End of the Second Day](#)

18:30 [Boat Tour on the River Rhine and Conference Dinner](#)



- 09:10 **Enhancing the Motivation for Use of Voluntary Fire Alarming Systems by Integrating Smart Home Concepts**  
Jörg Kelleter
- 09:30 **Lead (Pb) Material Footprint in Europe due to the Maintenance of Fire Alarm System Battery Packs: Analysis of Causes and Order of Magnitude Estimation**  
Amaya Balaguer-Telleria, Hector Ortiz, Ying Gao, Ying Cui, Hong-Sheng Yang, Feng Liu, Lei Xu, Ao Gao
- 09:50 **Investigation of Smoke Stratification and In-rack Detection**  
Peter Massingberd-Mundy, Yun Jiang
- 10:10 **Integration of Operational Data and Suppression Methods to Advance Risk Quantification for Air Aspirated Very Early Warning Fire Detection Systems**  
Ashley Lindeman, Gabriel Taylor

10:30 **Break**

**Session 13: Batteries and Fire Detection**

Session Chair: Peter Massingberd-Mundy

- 10:50 **An Experimental Study on Thermal Runaway Fire Detection and False Alarm Scenarios of Li-ion Battery Energy Storage Systems**  
Ying Gao, Ying Cui, Hong-Sheng Yang, Feng Liu, Lei Xu, Ao Gao, Amaya Balaguer-Telleria, Hector Ortiz
- 11:10 **BLEVE, or no BLEVE, That is the Question – On the Superheat Limits of Solvents Commonly used in Li-ion Batteries**  
Jiann C. Yang
- 11:30 **On the Development of Test Methods for Evaluation of Detection and Mitigation for Lithium Battery Failure**  
Josh Dinaburg

11:50 **Lunch**

**Session 14: Fire Detection**

Session Chair: Jacqueline Wilmot

- 13:20 **Early Detection of Electrical Failures due to Loose Connections in Small Enclosures**  
Stanislav Kostka, Yibing Xin
- 13:40 **Using Optical Probe for Composite Smoke and Gas in Situ Early Fire Detection**  
Kaiyuan Li, Hongyong Yuan, Tao Chen, Lida Huang
- 14:00 **Smoke Detector Spacing in High Ceiling Spaces**  
Mishuk Datta

14:20 **Break**

**Session 15: Algorithms and Maintenance**

Session Chair: Andreas Czulwik

- 14:40 **Data-Driven Parameter Optimization for Fire Detection Algorithms**  
Steffen Limmer, Martin Zimmermann, Aleksandar Duric
- 15:00 **DA-GRU: A Domain Adaptation and Gate Recurrent Unit based Multi-Parameter Fire Detection Method using Simulated and Combustion Experimental Dataset**  
Xiaoyan Liu, Jiping Zhu, Yongming Zhang, Qixing Zhang
- 15:20 **Analyzing the Effect of Increasing Signal Correlation on Multi-Criteria Fire Alarm Performance**  
Miaomiao Yu, Hongyong Yuan
- 15:40 **Conclusion and Closing of the Conference** by Amanda Kimball & Andreas Czulwik



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**Venue:** The conference will take place in the **MC-Building** of the Duisburg Campus of the University of Duisburg-Essen. The building can be reached via the address: Lotharstrasse 1, in 47057 Duisburg.

