



INVITED SESSION SUMMARY

Title of Session:

Human-Centered Security in Resource-Constrained Computing: Bridging IoT Security, Human Trust, and Emerging Technologies

Name, Title and Affiliation of Chair:

Chair:

Mr. Nordine Quadar

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Co-Chaired by:

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Details of Session (including aim and scope):

As intelligent systems become increasingly embedded in our daily lives, securing resource-constrained devices while maintaining human trust and usability presents unique challenges. With over 29 billion IoT devices expected by 2030, we face not just technical security challenges, but also critical human factors considerations. This session explores human-centered security solutions that balance robust protection with usability, transparency, and ethical considerations in resource-constrained environments.

The session aims to bridge the gap between technical security requirements and human needs, focusing on solutions that enhance both security and user experience while operating within severe resource constraints. Special emphasis is placed on transparent security mechanisms, human-friendly interfaces, and ethical considerations in deploying security solutions. Moreover, this session aims to discuss critical challenges in securing next-generation IoT and edge computing systems while operating within severe resource constraints

Topics of interest include, but are not limited to:

Human-Centered Security Design:

- Transparent security indicators and notifications
- Privacy-preserving user interactions
- Security solution accessibility and inclusivity
- Human factors in security policy enforcement
- User trust development in autonomous security systems
- Cognitive load optimization in security interfaces

Explainable Security:

- Transparent threat detection and notification
- Human-readable security logs and alerts
- Visual analytics for security monitoring
- Explainable AI in security decisions
- User feedback integration in security systems

Advanced Technical Security Solutions:

- Lightweight post-quantum cryptography
- Human-aware AI security models
- Energy-efficient security protocols
- Context-aware authentication systems
- Adaptive security based on user or device behavior

Practical Applications:

- Smart home security user experience
- Healthcare IoT privacy protection
- Industrial IoT safety and security
- Smart city privacy preservation
- Wearable device security
- Accessibility in security solutions

Security Education and Awareness:

- User training for IoT security
- Security awareness in constrained environments
- Interactive security guidance systems
- Gamification of security practices
- User empowerment in security decisions

Ethical and Privacy Considerations:

- Privacy-by-design in constrained environments
- Ethical AI-based security solutions
- Data minimization strategies
- User consent management
- Cultural sensitivity in security implementations
- Regulatory compliance and human rights

Main Contributing Researchers / Research Centres (tentative, if known at this stage):

Website URL of Call for Papers (if any):

Email & Contact Details:

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