

Call for Papers



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2021 IEEE Virtual International Symposium on Technologies for Homeland Security

November 8–9, 2021 • information@ieee-hst.org

Call for Papers & Posters

We are pleased to announce that the 20th Annual IEEE Symposium on Technologies for Homeland Security (HST '21), will be held November 8–9, 2021 as a virtual event. This symposium will bring together innovators from leading academia, industry, businesses, Homeland Security Centers of Excellence, and government agencies to provide a forum to discuss ideas, concepts, and experimental results.

Produced by IEEE with technical and organizational support from IEEE, IEEE Boston Section, IEEE-USA, MIT Lincoln Laboratory, and Raytheon Technologies. This year's event will once again showcase selected technical papers highlighting emerging technologies in the following areas:

**Border Security, Critical Infrastructure
Protection, and Law Enforcement**

**Climate Change and
Homeland Resilience**

Cyber Security

**Frontier and
Emerging Technologies**

We are currently seeking technical paper submissions in the above areas. This year, the Homeland Security Technology community has come together to respond and develop technology to address the challenges of COVID-19 and we anticipate HST'21 to reflect that focus. Accordingly, all areas are inclusive of technologies related to the global COVID-19 pandemic. Papers examining the feasibility of transition to practice will also be considered. All areas will cover the following common topics:

- Strategy, threat characterization, operational concepts, and risk analysis;
- Modeling, simulation, experimentation, exercises & training; and
- Testbeds, standards, performance, and evaluations.

Contact Information

For more detailed information on the Call for Papers, as well as Sponsorship and Exhibit Opportunities, visit the website: <http://ieee-hst.org/> or email: information@ieee-hst.org. Submissions should be sent to the following website: <https://cmt3.research.microsoft.com/HST2021/>

Important Dates *(All deadlines are by midnight Eastern Standard Time)*

Paper Extended Abstract Deadline: June 1, 2021
Paper Acceptance Notification: July 16, 2021
Final Paper Submission Deadline: September 24, 2021

Organizing Committee

General Chair: James Flavin, MIT Lincoln Laboratory
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and Biometrics*
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Arash Samani, Systems & Technology Research
Cyber Security
Hong Liu, UMass Dartmouth
Firas Glaiel, Raytheon
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Border Security, Critical Infrastructure Protection and Law Enforcement

Track Focus: Technologies to protect borders, critical infrastructure, key resources (CI/KR), population centers, and to facilitate threat detection (including chemical, biological, nuclear, explosives) and counter-terrorism surveillance. Technologies to track responders, improve situational awareness, and better mitigate, respond to, and recover from incidents. Technologies that enable remote detection of unlawful movement or action, and non-invasive transport screening. Biometrics and forensics technologies to aid law enforcement for effective data analysis, identification verification, and evidence evaluation.

Topics of interest to this track include, but are not limited to:

- Detection of hazardous materials, field detection equipment, dispersion tracking
- Machine learning, advanced analytic methods, predictive modeling
- Situational awareness/situational understanding and decision support
- Decontamination and restoration strategies, equipment, approaches, and sensing following WMD events
- Autonomous, robotic, composable, and artificial intelligence for offsetting human response capabilities
- Personnel screening
- Container/Compartment/Vehicle screening (detection, monitoring, and tracking)
- Port (land, sea, and air) and in-between-port surveillance, sensors and intelligence integration and data analytics
- Automated recognition and identification of suspicious objects
- Surveillance and communications (especially in remote environments)
- Multimodal biometrics and new biometrics and novel sensing technologies such as wearable technology applications
- Robust biometrics with respect to standoff, environmental conditions, channel impairments, and adversaries
- Nationwide and international biometric data interoperability and statistical estimation and reporting
- Evaluation of the scientific basis, validity, reliability, and uncertainty of forensic analyses under realistic case scenarios
- Human observer bias and sources of human error with forensic sciences
- Tools and protocols (automated and manual) for forensic examinations, methods, and practices
- Bio/pandemic threats at border crossings/ports of entry
- Detection/mitigation of cyber as well as physical attacks on CI/KR particularly electrical & water grids
- Economic models to support the development & deployment of new technology and enable the transformation of the CI/KR infrastructure

Cyber Security

Track focus: Technologies to enable rapid and efficient cyber operations while protecting availability, integrity, and confidentiality of information and services. Technologies that enable identification and apprehension of cyber criminals, characterization of cyber adversaries, and effective cyber resilience, control, and mitigation.

Topics of interest to this track include, but are not limited to:

- Host and network security, mobile security technologies, and continuous diagnostics and mitigation
- Cyber and cyber-physical incident response
- Industrial control system/critical infrastructure security
- Security for the Internet of Things, including safety-critical devices
- Cloud infrastructure and platform security
- Cyber event investigations, forensics, and malware analysis
- Applications of artificial intelligence/ machine learning for securing cyber space
- Supply chain security
- Attack and defense modeling and characterization
- Trust models and architectures
- Securing autonomous and cyber-physical systems such as robots

Climate Change and Homeland Resilience

Track focus: Climate change presents an enduring risk to homeland security across a wide range of specific threat vectors including, increased heat waves, extended droughts, precipitation-based flooding, rising sea levels, and increased frequency and intensity of major storms. These threats impact societal health, critical infrastructure, and economic well-being. The United

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States needs to develop and deploy adaptation approaches across multiple geographic and infrastructure sectors and build systems that reduce overall greenhouse gas emissions in parallel to mitigate the worst consequences of climate change. Government leaders at all levels require information to aid in mid- and long-term planning to proactively and effectively adapt to climate risks. This session brings together leaders from industry, academia and government to discuss challenges and solutions to these climate-driven threats to homeland security.

Topics of interest to this track include, but are not limited to:

- Remote sensing and data exploitation to understand climate drivers and impacts
- Risk analysis and adaptation approaches for critical domestic infrastructure
- Power generation, energy, and transportation system resilience approaches and migration to provide clean energy
- Modeling and decision support tools to guide adaptive decision making
- Climate impacts on public health

Frontier and Emerging Technologies

Special Topics focus: New technologies and innovative applications of existing technology with promise to affect Homeland Security that are not covered in other tracks.

Instructions for Paper

Paper Submissions

Prospective paper authors are invited to submit one or more detailed **extended abstracts by June 1, 2021**. The abstracts are to be **three to seven pages in length** (minimum 12 point font) and will serve as the basis for acceptance of papers for the conference. Authors will be notified of the review result (i.e., acceptance or rejection), with any applicable comments, by July 16, 2021. The abstract should include: the authors(s) title, name, address, phone, email and organizational affiliation within the page limit. Attached to this should be a one page or shorter biography of the presenting author.

A **completed paper**, is required only from authors receiving a notice of acceptance from the conference. This paper should be prepared in standard IEEE format and not exceed seven pages, including all illustrations and references. Technical papers must not substantially overlap with material published at or simultaneously submitted to another venue. Final paper manuscripts must be submitted by September 24, 2021.

Please note: Accepted paper submissions require at least one author to register and pay the conference fee. The organizers of HST, as well as our attendees, expect all accepted papers to be presented at the conference. IEEE reserves the right to exclude a paper from distribution after the conference if the paper is not presented.

All submissions should be made at the following website: <https://cmt3.research.microsoft.com/HST2021/>

Publishing Information

All papers will be published in the conference proceedings and distributed to conference attendees. Extended versions of selected full technical papers that meet the publishing requirements may be published in selected journals and in the IEEE Xplore as part of the IEEE Conference Publication Program.

Call for Sponsors and Virtual Exhibitors

A limited number of sponsorships and exhibit packages are available. To learn more, visit the conference website or contact or sponsorship@ieee-hst.org.

For more information on the conference, visit, www.ieee-hst.org or email, information@ieee-hst.org.